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ABSTRACT

The National Science Foundation (NSF) and the Association of American Universities are conducting an experiment in research grant administration designed to respond to the perceived needs of universities for more flexibility while assuring appropriate accountability for Federal research funds. The experiment delegates most grant administration authorities to universities and permits them to allocate costs among scientifically related NSF grants. The experiment is divided into two phases. Phase 1 (the Master Grant Phase) involved 245 grants awarded by NSF's Chemistry Division to the chemistry department of nine universities. Phase 2 (started in January 1981) modified and expanded the experiment to include almost all NSF grants to the nine Master Grant universities and three additional universities. The U. S. General Accounting Office believes the experiment can increase the economy and efficiency of Federal grant administration and provide more flexibility in the use of funds but indicates that some operational problems need to be corrected. This document discusses (in separate chapters) the experiment's background, objectives/scope, and methodology; Master Grant Phase, indicated to have improved research grant administration; the Phase 2 expansion; a review indicating that the NSF experiment needs to be better managed and evaluated; and conclusions/recommendations. (Author/JN)

ED223460

BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Director, The National Science Foundation

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NSF Experiment In Research Grant Administration Promising--Changes Needed To Assure Accountability

The National Science Foundation (NSF) and the Association of American Universities are conducting an experiment in research grant administration designed to respond to the perceived needs of universities for more flexibility while assuring appropriate accountability for Federal research funds. The experiment delegates most grant administrative authorities to universities and permits them to allocate costs among scientifically related NSF grants. GAO believes the experiment can increase the economy and efficiency of Federal research grant administration and provide more flexibility in the use of funds. However, some operational problems need to be corrected.

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

PROGRAM ANALYSIS
DIVISION

B-204472

The Honorable John B. Slaughter
Director, National Science
Foundation

Dear Dr. Slaughter:

This report on the Association of American Universities-National Science Foundation experiment in research grant administration focuses on the Master Grant phase of the experiment and the transition to Phase II. A draft of this report was submitted to you for your review and your written comments are included in Appendix I and have been considered in preparing the final report.

This report contains recommendations to you on page 41. As you know, Section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Chairmen of the Senate Committee on Governmental Affairs and its Subcommittee on Federal Expenditures, Research and Rules; Subcommittee on HUD-Independent Agencies, Senate Committee on Appropriations; Subcommittee on Science, Research, and Technology, House Committee on Science and Technology; Subcommittee on Intergovernmental Relations and Human Resources, House Committee on Government Operations; and Subcommittee on HUD-Independent Agencies, House Committee on Appropriations. We are also sending copies to the Director of the Office of Management and Budget and the Director of your Office of Audit and Oversight. We will make copies available to interested organizations and individuals on request.

Sincerely yours,

Morton A. Myers
Director

Enclosure

REPORT BY THE
UNITED STATES GENERAL
ACCOUNTING OFFICE

NSF EXPERIMENT IN RESEARCH GRANT ADMINISTRATION PROMISING--CHANGES NEEDED TO ASSURE ACCOUNTABILITY

DIGEST

American colleges and universities have become increasingly critical of the Federal system for assuring accountability for grants awarded to them. Universities have argued that Federal rules tend to limit their flexibility in managing research funds and have an eroding effect on the creativity vital to the research process. Federal officials have, in turn, argued that these rules are necessary to assure that Federal funds are spent in accordance with the terms of the research agreements, without fraud or waste.

In January 1979, the National Science Foundation (NSF), in collaboration with the Association of American Universities, undertook an experiment in research grant administration designed to respond to the perceived needs of universities for flexibility while assuring appropriate financial accountability. The primary objectives of the experiment are to:

--increase economy and efficiency of research projects supported by NSF through increased sharing of resources and greater authority for local decisionmaking;

--reduce paperwork associated with administering Federal grant programs; and

--improve accountability for expenditures of public funds by carefully defining the universities' responsibilities and providing standards for decisionmaking.

The experiment is divided into two phases. Phase I (the Master Grant phase) involved 245 grants awarded by NSF's Chemistry Division to the chemistry departments of nine universities with an award value of $34 million. Phase II, which started in January 1981, modified and expanded the experiment to include almost all NSF grants to the nine Master Grant phase universities and three additional universities (3,746 grants with an award value of $540 million).

The experiment differs from NSF's standard administration system in two key areas. First, most of the authority to review and approve administrative and budget changes after the grant has been made now lies with each university's organizational prior approval system (OPAS--the university management mechanism) instead of with the NSF grants officers and program officers. Second, the experiment provides universities and researchers more flexibility in the use of grant funds by allowing fund transfers between grants in the Master Grant phase (the aggregation concept) and permitting researchers to allocate costs among scientifically related NSF grants in Phase II (the relatedness concept). (See chapter 1.)

GAO made the review because of increasing concern for accountability of Federal research funds, and because the experiment could have a significant effect on how these funds are administered.

THE MASTER GRANT PHASE IMPROVED RESEARCH GRANT ADMINISTRATION

GAO found that the Master Grant phase delegation of grant administrative authorities to the university OPASs increased the efficiency and economy of administration primarily by processing grant budget changes more quickly, allowing researchers to incur pre-award costs to order equipment and hire personnel in advance of the start date of the research grant, and increasing the ability of researchers to respond more flexibly to changing project needs. In addition, GAO found that 13 researchers cited specific benefits they attributed to local OPAS approval, such as saving money.

The Master Grant phase had little effect on paperwork at the universities because OPAS actions still needed to be documented to assure accountability. At NSF, paperwork increased since the master grants required a new administrative system overlaying the standard system, although some of this increase was probably a one-time effect due to the experiment. Overall, the flow of paper was reduced some between the universities and NSF since grant administrative changes were approved by the universities' OPASs instead of NSF.

The Master Grant phase did not meet its objective of increasing accountability for expenditures of Federal research grant funds. GAO identified several areas where better controls are needed and found that OPASs with a review layer independent of the research department initiating the request better assured that actions were properly reviewed.

Documentation for some OPAS actions did not contain sufficient information to determine if applicable policies and procedures had been followed. GAO believes accountability will suffer if NSF decisions to award funds for a given scope of work are circumvented by researchers doing work in other areas, if grants with special grant conditions are not closely monitored to assure OPAS actions do not violate the special grant conditions, and if OPASs approve actions after they have already been taken. To preclude possible Anti-Deficiency Act problems, applicable NSF regulations or the grant agreements should make it clear that the approval process cannot impose an obligation on the United States prior to the availability of an appropriation to fund the costs. (See chapter 2.)

PHASE II EXPANSION

Phase II expanded the experiment from the participating chemistry departments to all participating university research departments having NSF grants. Phase II modified the experiment by substituting the concept of relatedness for aggregation. The relatedness concept increases the researcher's flexibility in allocating costs among scientifically or technically related NSF grants, thereby reducing problems with cost transfers and time and effort reporting.

The OPAS remains the key feature of the experiment and its functions become even more critical in Phase II. The OPAS will continue to review and approve researchers' requests to assure that delegated authorities are exercised properly. In addition, the OPAS is responsible for reviewing and approving requests to relate research grants. This additional responsibility will require the OPASs to have or have available the scientific expertise necessary to approve requests to relate research grants.

GAO reviewed five Master Grant phase participants Phase II OPAS structures. Four have a multi-layer structure with at least one layer independent of the department initiating the request. One does not include a review layer independent of the department initiating the request. At least one new Phase II participant is experimenting with an OPAS that may not have the scientific expertise necessary to review and approve relatedness requests.

There will be some loss of financial accountability for individual grants that are scientifically related. Expenditures made for related research grants are reported to NSF as having been spent on the grants they were awarded for, not on the grant they were actually spent on. Therefore, although the total spent on two grants that were related would be accurate, the actual amount spent on each individual grant could not be determined. (See chapter 3.)

THE NSF EXPERIMENT NEEDS TO BE BETTER MANAGED AND EVALUATED

NSF's monitoring of its experiment raised a number of concerns. NSF started the Master Grant phase without reviewing the existing university prior approval systems, or how these systems exercised the grant administrative authorities that were delegated to them prior to the experiment. GAO found that NSF did not closely monitor the universities' use of the master grant authorities and did not always adequately inform the universities of changes, modifications, etc., to the experiment.

NSF expanded the experiment to Phase II without conducting all of the evaluations planned for the Master Grant phase. Although the OPAS remained the key feature of the experiment, NSF did not evaluate the adequacy of the existing OPASs at the participating universities before expanding the OPAS authorities to all grants at the universities. At the time of our review, NSF did not have a formal plan to evaluate Phase II of the experiment. (See chapter 4.)

RECOMMENDATIONS

The Director of NSF should require that:

--Each university's OPAS include an official independent of the participating departments who can assure that each department is exercising the delegated authorities properly and who has or has available the scientific expertise necessary to review and approve actions.

--NSF review each university's OPAS to assure that the university has established a system that can act responsibly before any delegation of prior approval authorities is made.

--Applicable NSF regulations or grant agreements explicitly provide that the authority to approve pre-award costs cannot impose an obligation on the United States prior to the availability of appropriations.

--NSF develop a Phase II evaluation plan and assure that the necessary resources are available to carry it out. The evaluation should include a thorough review of each university's OPAS policies, procedures, and actions, and be performed by official(s) independent of those managing the experiment.

--NSF closely monitor the universities' use of the experiment's authorities and promptly provide the universities with information on changes, modifications, etc., to the experiment.

In addition, GAO makes several recommendations to the Director, NSF, detailing how accountability for OPAS actions can be improved. (See chapter 5.)

AGENCY COMMENTS

NSF and OMB generally concurred with GAO's conclusion that the experiment has important potential benefits for the future administration of Federal research grant funds. NSF agreed with or planned to consider most of GAO's recommendations. NSF provided information contrary to that previously given to GAO which affected two recommendations.

The recommendation regarding special grant conditions originally required that each university provide information to NSF to allow it to monitor these conditions. It has been revised to allow OPASs to be responsible for assuring that special grant conditions are not violated. The recommendation requires that NSF assure that each participating university is aware of its responsibilities. The recommendation requiring NSF to provide adequate audit coverage or return the responsibility to the cognizant audit agencies was deleted since NSF informed GAO that the cognizant audit agencies concerned have the responsibility.

OMB's comments clarified its position on the relatedness concept's effect on accountability. (See appendixes I and II.)

Contents

Page

DIGEST i

CHAPTER

1 INTRODUCTION 1

- Background 1
- The experiment in research grant administration 3
- Objectives, scope, and methodology 4
- OMB supports experiment 6

2 MASTER GRANT PHASE IMPROVED RESEARCH GRANT ADMINISTRATION 7

- OPAS policies and procedures 7
- Master grant delegated authorities 8
  - Approval of actions by OPAS 8
  - Aggregation concept used very little 11
- Research grant economy and efficiency increase under the Master Grant phase 11
  - OPAS provides faster approval 12
  - Pre-award costs allow grants to start more promptly 13
  - OPAS increases ability to respond to grant needs 14
- Master Grant phase paperwork 14
- Adequate controls needed for accountability 15
  - OPASs with an independent review layer provide better accountability 16
  - Documenting OPAS actions varies 17
  - Retroactive approvals could hurt accountability 18
  - Scientific accountability 19

3 PHASE II EXPANSION 21

- Rationale for change to Phase II 21
- The relatedness concept 22
  - Reporting expenditures for related research grants 23
- Implementing Phase II at the universities 23
- Phase II OPAS structures 23
  - Multi-layer OPAS 23
  - Single layer OPAS 25

Page

Additional Phase II participants' OPAS structures 26
Researchers' and administrators' reactions to Phase II 27

4 THE NSF EXPERIMENT NEEDS TO BE BETTER MANAGED AND EVALUATED 28

Prior approval systems in effect before master grants not reviewed 28
NSF did not closely monitor the experiment 29
  Accountability problems at one university not identified 29
  Special grant conditions were not monitored 31
  Implementation of Phase II needed better planning 31
  Communication between NSF and universities could be improved 31
More evaluation needed 32
  Master grant evaluations not completed prior to expanding to Phase II 32
  Little evaluation of universities' OPASs prior to expanding to Phase II 34
  Responsibility for audit of experiment's grants 34
  NSF review of experiment 35

5 CONCLUSIONS AND RECOMMENDATIONS 37

The Master Grant phase's effect on research grant administration 37
Phase II has additional benefits 38
Changes are needed in Phase II to improve the experiment 39
  An independent level of review and scientific expertise 39
  Adequate documentation of OPAS actions is essential 40
  Monitoring the experiment 40
  An evaluation plan 41
Financial accountability for individual grants 41
Recommendations 41
Agency comments and our response 42

Page

APPENDIX

I NSF'S COMMENTS AND GAO'S RESPONSE 44

II OMB'S COMMENTS AND GAO'S RESPONSE 57

III COMPARING THE STANDARD AND EXPERIMENTAL POST-AWARD SYSTEMS 60

TABLES

1 Authorities delegated to universities by master grant agreements 9

2 OPAS actions requiring newly delegated master grant authorities 10

3 Comparison of the frequency and type of actions between experimental and standard systems 10

4 Comparison of master grant OPAS with NSF approval times 13

5 Documenting OPAS actions 18

6 Profile of Phase II universities 24

7 Approving changes in the grant awards 62

ABBREVIATIONS

FCTR	Federal Cash Transaction Report
GAO	General Accounting Office
NSF	National Science Foundation
OMB	Office of Management and Budget
OPAS	Organizational Prior Approval System
UwOPAS	University-wide Organizational Prior Approval System

CHAPTER 1

INTRODUCTION

Most federally funded basic research is carried out in our Nation's colleges and universities. Recently, these institutions have become increasingly critical of the Federal system for assuring accountability for the funds allocated to them. Universities have argued that Federal rules tend to limit their flexibility in managing research funds and have an eroding effect on the creativity vital to the research process. Federal officials have, in turn, argued that these rules are necessary to assure that Federal funds are spent in accordance with the terms of the research agreements, without fraud or waste. Some of the organizations involved include the National Science Foundation (NSF), the National Institutes of Health, the Office of Management and Budget (OMB), and us, as well as university administrators and researchers, and members of Congress.

In January 1979, NSF, in collaboration with the Association of American Universities, undertook an experiment in grant administration designed to respond to the perceived needs of universities for flexibility while assuring appropriate financial accountability. NSF discussed the nature of the experiment with OMB, some congressional staffs, us, and others before undertaking it. The primary objectives of the experiment are to:

--increase economy and efficiency of research projects supported by NSF through increased sharing of resources and greater authority for local decisionmaking;

--reduce paperwork associated with administering Federal grant programs; and

--improve accountability for expenditures of public funds by carefully defining the universities' responsibilities and providing standards for decisionmaking.

BACKGROUND

The National Science Foundation is an independent Federal agency established under the National Science Foundation Act of 1950, as amended (42 U.S.C. 1861 *et seq.*) 1970. Its primary mission is to strengthen U.S. science by supporting basic research and science education. NSF fulfills this responsibility in part by sponsoring scientific research at educational institutions. Traditionally, it has used grants to support basic research.

Although individual researchers propose and conduct the research, NSF grants are normally made to a university, known as the grantee. NSF agrees to provide full or partial financial support for the costs of the research to be performed and the grantee agrees to perform the research, prudently manage the funds provided in the grant, and carry out the provisions of the grant award.

NSF's Division of Grants and Contracts is responsible for assuring that any proposed grant is consistent with applicable policies, regulations, directives, and fund certifications. The grants officer is the only NSF official with delegated authority to issue grant letters and to obligate NSF funds for expenditures under grants.

NSF program officers are the key personnel in the scientific/technological directorates who review, evaluate, and recommend proposals for grants, monitor the scientific aspects of grants, and review requests for changes in grant direction or management and for rebudgeting. The program officers approve all requests for administrative and budget changes except where decisions are reserved to the grants officers.

While NSF generally has not been significantly involved in conducting or managing the research on individual projects, NSF's grantees must follow certain grant administration requirements that are mandated for all recipients of Federal research grant funds. NSF grantees are required to have financial management systems that meet the requirements of OMB Circular A-110. The circular and its attachments provide the Federal policies and procedures governing Federal agencies' administration of grants to educational institutions. In addition, expenditures under NSF grants are governed by the Federal cost principles applicable to institutions of higher education contained in OMB Circular A-21.

Under the current research support system, many researchers receive support for their research in multiple, discrete grant awards of limited duration. OMB guidelines require these researchers to account separately for each grant. This accounting constraint may lead to cost transfers (a researcher transfers costs from one grant to another), especially when a researcher's overall research program is funded by several sources--some costs may be legitimately assigned to more than one source. Sometimes a researcher needs to make some legitimate but retroactive reallocation of charges, resulting in cost transfers. An award notice that arrives late can also lead to cost transfers since a university sometimes uses other funds to begin a grant to avoid delays or interruptions in the research. After the award notice arrives, the university uses cost transfers to allocate the costs to the appropriate grants.

OMB guidelines severely limit using cost transfers and require explicit documentation. If the cost transfers are not well documented, they may be disallowed. Universities believe such documentation is quite burdensome, limits their flexibility to manage research funds, and has an eroding effect on the creativity vital to the research process.

THE EXPERIMENT IN RESEARCH GRANT ADMINISTRATION

The experiment in research grant administration (hereinafter referred to as the experiment) is testing the feasibility of allowing universities greater flexibility to administer NSF research grants after the grants have been awarded, and is also testing ways to facilitate universities' and researchers' accounting for costs incurred on their research grants.

The experiment is divided into two phases. Phase I, called the Master Grant phase, involved grants awarded by NSF's Chemistry Division to the chemistry departments of nine universities. 1/ The 9 departments each had 2 master grants, for a total of 18 master grants incorporating 245 individual grants with an award value of almost $34 million. Existing NSF chemistry awards to each department became the first master grant. As NSF approved new chemistry awards during the Master Grant phase, they became part of the second master grant. New master grants were needed at 2-year intervals because NSF has 2-year appropriations. Phase II, which started in January 1981, expanded the experiment to include almost all NSF grants awarded to the nine original participating universities, plus three additional universities. 2/ The 12 Phase II universities had 3,746 NSF grants with an award value of $540 million.

The experiment differs in two key aspects from NSF's standard administration system which is used for all NSF grants not included in the experiment. (We compare the standard and experimental post-award policies and procedures in appendix III.) First, under the experiment, most of the authority to review and approve post-award grant administrative and budget changes has been delegated to each university's organizational prior approval system (OPAS) instead of to the NSF grants officers and program officers. The organizational prior approval system is the university management mechanism that enables the university to use the authorities delegated by NSF to review and approve changes in the administrative and budget details of a grant or grants under the master grant (e.g., grant budget changes, extensions of time, purchase of research equipment, etc.). Use of the OPAS for review and approval is supposed to eliminate the flow of individual requests back and forth between the university and NSF and the resulting delays in decisionmaking.

1/The University of California at Los Angeles, the University of California at San Diego, the California Institute of Technology, the University of Wisconsin at Madison, the University of Illinois at Urbana-Champaign, Columbia University, the State University of New York at Stony Brook, Massachusetts Institute of Technology, and the University of Florida.

2/Princeton University, Stanford University, and Yale University.

The additional approval authority delegated by NSF gave participating universities the ability to rebudget grant funds, acquire special purpose equipment, approve foreign travel, charge grants for pre-award costs incurred at the risk of the universities, extend the performance period of the grant, transfer funds between research grants, and make several other grant administrative changes.

NSF viewed the delegation of the additional authority as a low-risk situation at the participating universities since they already had prior approval systems in place and since the additional authority applied only to the master grant awards. The participating universities had prior approval systems in place because in 1977, NSF delegated authority to approve four types of rebudgeting actions to any university which established a prior approval system (see page 63). NSF also viewed OPAS approval as a way to maintain (or possibly increase) grant fund accountability by defining the universities' responsibilities and providing standards for decisionmaking while reducing Federal intrusion and paperwork in the administration of NSF's research grants at the universities.

The second key aspect of the experiment, introducing the concepts of aggregation and relatedness, was designed to give the universities and researchers more flexibility in the use of grant funds. The aggregation concept, used in the Master Grant phase, grouped grants together under one master grant for administrative purposes, and allowed the transfer of funds between grants in each master grant. In Phase II, relatedness replaced aggregation. The relatedness concept permits researchers to allocate costs among their individual NSF grants, provided the grants are scientifically or technically related. The Phase II relatedness concept differs from the aggregation concept in that it eliminates the need to group individual awards into master grants and it requires determining scientific relatedness.

OBJECTIVES, SCOPE, AND METHODOLOGY

Because of the increasing concern for how Federal research grant funds are administered and the experiment's potential effect on accounting for these funds, we reviewed the experiment in research grant administration to assess whether the Master Grant phase met its objectives, the status of Phase II of the experiment, NSF's evaluation of the Master Grant phase and its plans to evaluate Phase II. One congressional committee and four subcommittees have expressed an interest in our review of the experiment: the Senate Committee on Governmental Affairs and its Subcommittee on Federal Expenditures, Research and Rules; the Subcommittee on HUD-Independent Agencies, Senate Committee on Appropriations; the Subcommittee on Science, Research and Technology, House Committee on Science and Technology; and the Subcommittee on Intergovernmental Relations and Human Resources, House Committee on Government Operations.

This review was performed in accordance with our "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions." Of the nine universities participating in the Master Grant phase of the experiment, we selected seven 1/ to to review their use of the experiment's authorities. The criterion for this selection was that they were located in GAO regions 2/ that had at least two universities participating in the experiment in order to maximize the use of our resources. The two universities that were not reviewed did not differ markedly in terms of the amount or number of grants involved in the experiment. We reviewed all 163 Master Grant phase actions taken by the selected universities during the experiment's first 23 months that required one of the newly delegated authorities. We interviewed 81 researchers who had used the Master Grant authorities and were available to talk to us, 8 department chairmen (1 university had 2 different chairmen during the Master Grant phase), and 21 university administrators. We also interviewed NSF officials in the Office of Audit and Oversight, Division of Grants and Contracts, and the Chemistry Division, and officials at the Office of Management and Budget. In addition we interviewed officials at the audit agencies responsible for auditing the participating universities: the Department of Health and Human Services' Inspector General's Office, and the Contract Audit Agency of the Department of Defense.

In addition, we selected a sample of NSF grants that were awarded prior to the experiment to the universities included in our review to compare selected aspects of NSF's standard administration system to the Master Grant experimental system. We requested the grant files for all awards from the Chemistry Division to the chemistry departments of the seven universities in our review that were active during the 6-month period prior to the Master Grant phase. These grants were eventually included in the experiment or completed before the experiment began. NSF provided a list of 166 grants that were active in that period, but said many of the records were already in storage and would take several weeks to obtain. To avoid delays, we asked NSF to provide readily available files, and NSF provided 48. We have no reason to believe that this is not a representative sample since it contains almost one-third of the universe and the selection process was limited only by the location of the files.

1/The University of California at Los Angeles, the University of California at San Diego, the California Institute of Technology, the University of Wisconsin at Madison, the University of Illinois at Urbana-Champaign, Columbia University, and the State University of New York at Stony Brook.

2/The 49 continental States are divided into 15 GAO regions, each having at least one regional office.

Five of the seven universities included in our review had entered Phase II while we were still doing field work, so we obtained information on how they were implementing Phase II, although we did not review any Phase II actions. NSF provided some information on how the other universities planned to implement Phase II and we obtained additional information by calling the universities.

OMB SUPPORTS THE EXPERIMENT

OMB officials said expenditures for related research grants are consistent with OMB circulars on grant administration. The officials said the form of a grant is determined by the grantor agency. So, if two grants are made and are subsequently determined to be related, the researcher has, for administrative purposes, one grant. However, OMB does not require the related grants to be combined into one grant. For example, grant A funds can be spent for allowable costs of grant B (provided A and B are scientifically related) but will be reported to the grantor agency as having been spent on grant A. This is how NSF is handling financial reporting for Phase II.

OMB officials said that the peer review system will assure the scientific integrity of related research grants. For example, suppose a researcher has a biology grant and a physics grant that are related and that researcher spends all the biology grant funds on the physics grant. The expenditures would be reported as the amounts awarded for each grant, which obviously limits financial accountability for these grants. The officials said the control over expenditures for related grants will be the peer review system. For the example above, if the researcher did not do any work on the biology grant, he or she probably would not have been able to publish any research papers on it, and therefore, presumably, the peer review system would not award any further grants on this topic to the researcher. The officials said that the peer review system assures that there is scientific integrity for the individual grants even though, from a financial perspective, there will be none on an individual basis when grants are related (because costs can be charged and recorded against a different grant than the one they were incurred for).

OMB officials praised the experiment's attempt to deal with the problem of allocating a researcher's time and effort among basic research grants. OMB regulations require a researcher to report the time and effort spent on each grant. The officials recognized that a researcher with two or more grants for basic research is usually working in a single field of science but the current grant award system separates that researcher's research into discrete grants. OMB officials informed us that they do not believe it is necessary to maintain individual grant records for research grants that are scientifically related.

18

CHAPTER 2

MASTER GRANT PHASE IMPROVED RESEARCH GRANT ADMINISTRATION

Because the Organizational Prior Approval System (OPAS) is the mechanism the universities use to review and approve changes in the administrative management details of a grant, the OPAS has become the key to the experiment in research grant administration. Each university had an OPAS to exercise the newly delegated powers and assure proper accountability over NSF grant funds.

OPAS POLICIES AND PROCEDURES

The OPAS structures at the seven universities we reviewed are of two general types, those which include an independent review of OPAS actions outside the chemistry department (multi-layer) and those where approval occurs solely in the chemistry department (single layer). Four universities included an independent review outside the chemistry department, for example, the grants and contracts office, or the office of sponsored research, or both. The department chairman was the first layer of review in each of these systems except for one university, where the first layer was a committee of the department chairman and two chemistry faculty members.

Two universities had the department chairman act as the sole reviewing and approving official for most of the delegated authorities. One university was unique in that it required three layers for about one-half of the authorities and only one layer, the department chairman, for the other half. 1/ NSF required that the three universities that had the department chairman as the sole approving authority provide additional review and approval for those actions which involve the chairman's grants.

Four universities had restrictions or special conditions beyond the requirements of the master grant agreement with NSF. One university agreed to participate only after it was able to assure its researchers that they would retain control over their individual grant funds and that aggregation would only take place in reporting transactions to NSF, i.e., the aggregation concept would not be used to transfer funds between grants. One university chemistry department chairman did not allow fund transfers or foreign travel requests to be approved by the OPAS. One university required a researcher who wanted to use the pre-award feature to assure the university that if the award was not made the university would not be liable for costs incurred.

1/This university was grouped with the single layer OPASs since over 70 percent of the OPAS actions were approved by the department chairman only.

Although this requirement was not enforced for two subsequent pre-award approvals, the department chairman said in both of these cases assurance was obtained from an NSF official that once the university receives verbal notification of the pending award no risk would be involved in these pre-award approvals. Another university had a system which limited the effect of the master grants since it was already providing the chemistry department with many of the master grant features, such as providing funds for pre-award costs and funding gaps.

The master grant agreements required that the universities send a summary of OPAS actions to NSF on a periodic basis. Five of the universities fulfilled this requirement. One university only sent summaries for 10 of its 14 actions while another university had sent copies of 9 of its 12 actions.

MASTER GRANT DELEGATED AUTHORITIES

An OPAS action occurs when a researcher requests OPAS approval to use a delegated authority. For example, if a researcher wants to rebudget salary funds to purchase a piece of equipment, he initiates an OPAS action explaining what he wants to do and why. The written request and the OPAS approval or denial constitute an OPAS action. The authorities delegated to the OPAS and a brief description of what each authority allows the researcher or OPAS to do are listed in table 1.

Approval of actions by OPAS

We reviewed every action taken by the OPASs at the seven universities we reviewed that exercised the newly delegated master grant authorities. The number and types of actions approved by each university's OPAS are listed in table 2. No actions were disapproved.

Approximately 60 percent of the researchers who had grants under the master grants used one of the master grant authorities at least once. The percentage of researchers at the universities who used the master grant authorities ranged from a low of 17 percent to a high of 77 percent.

The frequency of actions per grant taken under the Master Grant phase of the experiment, either by type or total, did not differ significantly as a result of delegating the approval authorities to the universities from what it was when NSF was reviewing such actions. We compared the number and frequency of OPAS actions to the number and frequency of NSF-approved actions taken on the sample of grants that were not in the experiment and which used the standard system. Only four of the nine master grant authorities could be compared since the participating universities used only six of the nine master grant authorities and two of those (fund transfers and pre-award) were not previously allowed under the standard system. The results are listed in table 3.

Table 1

Authorities Delegated To Universities By Master Grant Agreements a/

Authority	University OPAS May:
Fund transfers (new authority)	Transfer funds provided under a master grant among grants included within the master grant; reprogram funds between line items of the aggregated master grant budget.
Pre-award costs (new authority)	Incur costs up to 90 days prior to award date.
No-cost extensions	Extend expiration date of any grant under a master grant for up to 6 months.
Rebudgeting for	
--Special and general purpose equipment	Purchase special or general purpose equipment.
--Foreign travel	Approve foreign travel for a researcher and dependents.
--Contracting project efforts	Contract part of a grant's effort after an award has been made.
--Alterations and renovation	Approve alterations and renovation costs up to $10,000 to adapt space or utilities within a completed structure to accomplish the objective of NSF-supported activities.
--News release cost	Approve news release costs.
--Commercial production or distribution of grant materials	Approve the commercial production or distribution of materials produced under a master grant.

a/These authorities require prior approval before the action is taken. As in the standard administration system, only actions/expenditures not provided for in the award document need to be approved.

Table 2

OPAS Actions Requiring Newly Delegated Master Grant Authorities

University	Equipment	Preaward	Foreign Travel	No-cost Extension	Contracting Project Effort	Fund Transfers	Total
A	23	7	5	1	1	1	38
B	17	2	9	4	2	3	37
C	16	14	1	0	0	1	32
D	13	4	3	0	1	1	22
E	5	4	3	1	0	1	14
F	7	3	1	1	0	0	12
G	3	2	2	1	0	0	8
Total	84	36	24	8	4	7	163

Table 3

Comparison of the Frequency and Type of Actions Between Experimental and Standard Systems

	Experimental System		Standard System	
	Number	Percent	Number	Percent
Equipment	84	70.0	18	62.1
Foreign travel	24	20.0	8	27.6
No-cost extension	8	6.7	1	3.4
Contracting project effort	4	3.3	2	6.9
Total	120	100.0	29	100.0

There were 120 actions taken on the 201 grants under the master grants which averaged 0.6 actions per grant. The sample actions from the standard system also averaged 0.6 actions per grant. All OPAS actions were approved, and 28 of the 29 sample actions were approved.

Aggregation concept used very little

The aggregation concept was not used very much, except to report grant expenditures on an aggregated basis, because according to university officials, many researchers were reluctant to intermingle their research funds with those of other researchers, and the OPAS delegations for pre-award costs and no-cost extensions eliminated many situations where transfers between grants might have taken place.

The fund transfer authority was designed to increase the sharing of resources. However, the universities made little use of the aggregation concept to transfer funds between grants under a master grant.

University officials said there were several reasons why there was little use of the aggregation feature to transfer funds. The chemistry department chairman at one university did not believe aggregation should be used because experienced researchers might exploit the less experienced researchers and because deficiencies in the university's accounting system made using the aggregation concept risky. Officials at another university said they expected to have more fund transfers but not until the end of the master grant. A third university made three fund transfers ($2,129, $1,033, and $8) when the donor grants were completed or nearing completion and unexpended funds remained. Officials from three universities said researchers were reluctant to intermingle their funds with other researchers' funds.

Officials from one university said the OPAS delegations for pre-award costs and no-cost extensions eliminated many of the situations where transfers were necessary since both features extend the performance period of the grant and were used to minimize funding gaps.

RESEARCH GRANT ECONOMY AND EFFICIENCY INCREASE UNDER THE MASTER GRANT PHASE

One objective of the experiment is to increase the economy and efficiency of research projects by delegating greater authority for grant administration decisionmaking to the universities. Over 78 percent of the researchers interviewed who had used the OPAS believed it generally increased the economy and efficiency of their research. Researchers indicated that (1) the time and effort necessary to obtain approval of requests was reduced, (2) the pre-award feature provided the ability to begin work on grants more promptly and efficiently, and (3) local university approval increased their ability to respond flexibly to changing grant needs. Thirteen researchers with 15 OPAS actions cited specific benefits they attributed to local OPAS approval, such as saving money. In addition, although it is difficult to measure, there were indicators that one of the benefits of the Master Grant phase was improved morale.

OPAS provides faster approval

Over 67 percent of the researchers who had used the OPAS indicated that it reduced the length of time required for approval of their requested OPAS actions. Researchers noted that under the standard system a letter must be sent to the NSF program officer, which necessitated setting up a correspondence file, and sometimes sending follow-up letters. They noted that the local OPAS avoided the Federal bureaucratic processing and eliminated mail delays.

We identified six actions where, according to the researchers, fast OPAS approval made a significant contribution to the research grant. For example, one researcher received OPAS approval in 8 days to purchase research equipment not previously included in the budget. He said the equipment was vital to a major scientific discovery made by a postdoctoral student who was leaving soon. He said delay in approval could have meant losing the student before receiving the equipment, causing the research to suffer immensely.

Three researchers said fast OPAS approval resulted in saving money. For example, one researcher said OPAS approval in 3 days avoided a price increase on a laser purchase which saved approximately $10,000. Another researcher said he received OPAS approval in 6 days to purchase a replacement spectrophotometer which avoided a 10 percent price increase, saving $3,820.

We reviewed the time needed for OPAS approval at the seven universities. Data on dates of request and approval were available for only 125 of the 163 OPAS actions. The approvals ranged from the same day to 28 days and averaged 5.2 days for all OPAS actions. Data were available for 19 of the 29 actions in our sample of the NSF grants under the standard system. The approvals ranged from 6 to 35 days and averaged 15.4 days. Since it takes a minimum of another 2 to 3 days before the universities receive written notification of NSF approval, we believe OPAS approval is at least 12 days faster than the standard system. Table 4 lists the results of the comparison between OPAS approval times and NSF approval times under the standard system.

Table 4

Comparison of Master Grant OPAS with NSF Approval Times

		Average (days)	Range (days)
NSF Approved	19 a/	15.4	6-35
OPAS Approved	125	5.2	1-28
University A	37 b/	2.5	1-8
University B	4 c/	3.3	1-9
University C	32	6.9	1-28
University D	22	5.6	1-22
University E	10 d/	9.0	1-27
University F	12	2.5	1-8
University G	8	10.0	1-21

a/Data available for 19 of 29 actions.

b/Data available for 37 of 38 actions.

c/Data available for 4 of 37 actions--the OPAS form did not require dates for when action was requested and when it was approved.

d/Data available for 10 of 14 actions.

Pre-award costs allow grants to start more promptly

Seventy-five percent of the researchers who used the pre-award feature said the economy and efficiency of their research increased because the pre-award feature provided the ability to start work on grants more promptly. The researchers said it allowed them to order equipment and hire personnel in advance of the start date of their research grants which helped to maximize the amount of research that could be done during the grant period. They also said the pre-award authority serves as a bridge for funding gaps which could occur between grants. Two researchers said the pre-award authority enabled them to keep their research groups together by providing salary funds or accounts to charge so that the research groups did not have to be disbanded when funding gaps occurred.

We found five actions where, according to the researchers, specific benefits resulted from the use of the pre-award feature. For example, one researcher said he used the pre-award authority to synchronize the timing of an equipment purchase which required a delivery time of 3 months with the employment of a foreign post-doctoral student who was scheduled to return home 7 months after the start of the grant period. The researcher said he used the pre-award authority to have the equipment available at the start of the grant period. The researcher said the pre-award authority had a multiplier effect since the student was able to use the equipment for the full 7 months and train four other researchers in the group to use the equipment. Another researcher said he used the pre-award authority to purchase a piece of equipment before a higher price became effective, saving nearly $5,000.

OPAS increases ability to respond to grant needs

Almost 54 percent of the researchers who had used the OPAS mentioned that the OPAS approval mechanism increased their ability to respond flexibly to changing grant needs. Several researchers noted that it is difficult to accurately predict the needs of their research effort in a grant proposal submitted months before the start of a grant. The OPAS gives a researcher the ability to reallocate his or her resources through various budget changes. Requests for new research equipment or urgent travel can be approved quickly by the OPAS. The OPAS authority to approve a no-cost time extension to continue research helped several researchers. For example, at one university, four no-cost extensions were approved. In two of the four actions, although funds remained in the old grant and a new grant was pending, a gap between the expiration of the old and the beginning of the new would have interrupted the continuity of the research. The no-cost extensions bridged the gap by allowing the researcher to continue working using the funds remaining in the old grant.

We found four actions where, according to the researchers, the OPAS actions provided increased timeliness and/or flexibility that appeared greater than under the standard system. For example, one researcher discovered that his laboratory water was too impure to be used in his laser cooling system. Since the laser could not be used without the cooling system, the researcher said it was essential to his research that the purchase of a purification system be approved quickly. Our statistics showed an average NSF approval time of approximately 2-1/2 weeks. OPAS approval was received the same day as the request.

MASTER GRANT PHASE PAPERWORK

The experiment's second objective is to reduce paperwork associated with the administration of Federal grant programs. The Master Grant phase had little effect on paperwork at the universities because OPAS actions still need to be documented to assure accountability. However, the experiment did reduce the flow of paper between the universities and NSF since grant administrative changes are now approved by the universities' OPASs instead of NSF. At NSF, the Master Grant phase increased paperwork since it required identifying and converting existing awards from the standard system to the experimental system and it required a new administrative system overlaying the standard system. Some of this additional effort was a one-time cost due to the changes.

Although 29 percent of the researchers believed their paperwork had decreased, over 70 percent believed there had been no change in paperwork and none believed there had been an increase. The department chairmen were evenly split on the paperwork question--50 percent believed it had increased and 50 percent believed there had been no change. Over 66 percent of the OPAS administrators said there was no change in paperwork. About 19 percent said there was an increase because they are now reviewing and approving OPAS actions. Two administrators pointed out that the increase was more than offset by the benefits. Several NSF Chemistry Division program officers noted a slight reduction in their paperwork because they no longer had to approve most grant administrative changes.

The Master Grant phase did reduce some financial reporting paperwork. Financial reporting of grant expenditures on the Federal Cash Transaction Reports was reduced from a line entry for each grant to a single line entry for each master grant. However, the universities still kept individual financial grant records because the researchers need this information to manage their expenditures and to help develop budget estimates for future grant proposals.

ADEQUATE CONTROLS NEEDED FOR ACCOUNTABILITY

The experiment's third objective sought to improve accountability for the expenditures of public funds by carefully defining the universities' responsibilities and providing standards for decisionmaking. We identified several areas where better controls are needed to assure adequate accountability. We found that OPASs with a review layer independent of the chemistry department provided better accountability for OPAS actions than OPASs consisting of only the chemistry department chairman, that the documentation requirements for OPAS actions varied, and that actions requiring prior approval were approved retroactively. In addition, if NSF decisions to award funds for a given scope of work are circumvented by doing work in other areas, accountability will be affected.

OPASs with an independent review layer provide better accountability

Our review of OPAS actions at the four universities with a review layer which was independent of the chemistry department found that at three of the universities the independent layer(s) of review questioned certain actions. Consequently, the actions were modified to provide additional documentation or additional review was performed to assure that the action was properly explained and documented. For example, at one university 3 of the 14 actions were modified primarily as a result of questions raised by a university-wide official who reviewed the request after the department chairman had approved them. Another official who also reviewed all OPAS actions said there had been one or two instances where OPAS requests were returned by him for clarification of the request or to provide further support. After the changes were made, the actions were approved.

Our review of the OPAS actions at the four universities with a review layer independent of the chemistry department did not identify any major problems; however, we did find problems at two of the three universities with single layer OPASs. At two universities we found that department chairmen approved their own requests to rebudget funds to purchase research equipment. At both schools, the master grant agreement required that the department chairman's request be approved by another university official. One department chairman approved his own request to purchase $50,000 of computer-related equipment. University officials acknowledged that the request should have been approved by another university official. The other department chairman approved his own request to rebudget $2,425 from salaries to equipment. The chairman said he was not aware that the master grant agreement required a subsequent review by another university official.

One university with a single layer OPAS presents a vivid contrast to the multi-layer systems discussed above. The department chairman said he does not review OPAS requests for scientific propriety, research relevance, or policy permissibility and that he has never denied a researcher's request. The chairman's lack of concern with OPAS actions is emphasized by his designation of an administrative staff person as an alternative official to approve OPAS requests. In one case involving a foreign travel action, the chairman admitted that he would not have approved an action approved by the administrative staff person had he reviewed it.

The director of this university's office which has responsibility for administering all research grants awarded to the university admitted his initial hesitancy in agreeing to place all master grant approval authorities at the department level. He said it could have some benefits in that it forces the department to take responsibility for its action. However, he said he

28

was disturbed by the lack of a university-wide perspective. To insure such perspective, he intends to put his office back into the OPAS structure for Phase II of the experiment.

Documenting OPAS actions varies

Documenting OPAS actions is an important means of assuring accountability for NSF research grant funds. The documented actions provide evidence that permits a determination that applicable policies and procedures have been followed in exercising the delegated authorities. According to the master grant agreements, the OPAS is intended to assure that there are adequate university reviews and approvals of decisions made which affect the management of grants. The agreements require these decisions and the review and approval of them to be documented. However, the documentation required by these agreements varied.

Four of the seven agreements required the documentation to include a description of the decision being made and the scientific, technical, and/or administrative reasons for it. The other three agreements only required that the documentation include a description of the decision being made. All seven agreements required that the documentation show that it has been reviewed for scientific or technical need and propriety, research relevance, effective utilization of institutional resources, policy permissibility, and fund availability.

We reviewed all 163 OPAS decisions (actions) to determine if the documentation provided sufficient information to allow for an independent review to determine if applicable policies and procedures have been followed in exercising OPAS authorities. We believe that a description of the action and the scientific, technical, or administrative reason for the action is essential to allow such a review. As shown on table 5, most of the OPAS actions provided this information even though the reason was not required to be documented at three universities. It is not possible to review the remaining OPAS actions to determine if applicable policies and procedures have been followed because the reason for the action was not documented. We believe that to allow for an independent review of OPAS actions, the documentation should include a description of the action and the scientific, technical or administrative reason for it. In addition, NSF, which reserves the right to withdraw a university's delegated prior approval authorities if the university mismanages them, will not be able to determine if the university mismanages the authorities if the reasons for the actions are not documented.

Table 5

Documenting OPAS Actions

University	Number of Actions	Description Provided	Reason Provided	SIFR a/
A	38	38	24	22
B	37	37	34	34
C	32	32	31	31
D	22	22	22	17
E	14	14	12	11
F	12	11	8	4
G	8	8	7	7
Total	163	162	138	126

a/SIFR: sufficient information for review--to permit an effective OPAS review of scientific or technical need and propriety, research relevance, effective utilization of institutional resources, policy permissibility, and fund availability.

Retroactive approvals could hurt accountability

The OPAS is designed to assure that the delegated authorities are exercised properly. The master grant agreements required the OPASs to approve a researcher's request before an action is taken. When actions are approved after they have already been made, the system has failed to function properly and accountability could suffer. We found six actions requiring prior approval that were retroactively approved.

Three retroactive approvals were for pre-award costs. The retroactively approved pre-award costs appeared to have the objective of transferring costs between grants for reasons of convenience, which is prohibited by the Federal cost principles. For example, costs that had been charged to an expired NSF grant in one master grant were transferred to a new NSF grant in a different master grant by retroactively approving the request to incur pre-award costs on the new grant. The researcher had a grant under the 1978 master grant which was to expire on February 29, 1980. He was awarded a new grant under the 1979 master grant with an effective date of November 15, 1979. On December 12, 1979, the OPAS approved his request to incur pre-award costs on his new grant which had started on November 15.

The researcher's request stated "Costs incurred [$11,408] on [the 1978 master grant] must be transferred to its renewal award [the 1979 master grant] because of a gap in funding." However, as the dates above show, there was no gap in grant funding, and the request to incur pre-award costs came after the new grant's starting date. University officials said that the request should have gone to NSF for approval because it involved costs that had already been incurred.

The remaining three retroactively approved OPAS actions were requests for reimbursing costs already incurred for foreign travel. For example, one researcher requested approval to pay for a postdoctoral student's travel from his previous place of residence to the university. There appears to be no reason why this action should not have been requested prior to the trip. However, another researcher's request for reimbursement of foreign travel costs seemed reasonable even if it was approved retroactively. The researcher went to England to work with another scientist on research being supported by NSF. The other scientist had a grant that paid for the researcher's air travel and some of his living expenses. Since his costs exceeded what the other grant could pay for, the researcher asked for reimbursement of his living expenses in England after he returned to the university. The OPAS documentation noted that a similar request for travel was made in October 1978 and approved by NSF. The documentation also noted that approval would have been given if the request had been made prior to the trip.

In addition, delegating authority to the OPAS to approve pre-award costs could have implications under the Anti-Deficiency Act (31 U.S.C. 665), which prohibits agencies from incurring obligations in advance of appropriations. As noted previously, pre-award costs, to be allowable under the experiment, must have been incurred within the 90-day period immediately preceding the effective date of the grant. If a particular award were made at the beginning of a fiscal year, the preceding 90-day period could include some time before the new appropriation became available. To preclude possible Anti-Deficiency Act problems, applicable NSF regulations or the grant agreements should make it clear that the approval process cannot impose an obligation on the United States prior to the availability of an appropriation to fund the costs. See 56 Comp. Gen. 31 (1976).

Scientific accountability

NSF said pre-award scientific accountability will probably not be affected by the experiment because it does not change the way proposals are submitted, reviewed, and funded by NSF through the peer review process. However, NSF has not determined what the universities' responsibilities for post-award scientific accountability should be. We identified one concern during our review which could affect post-award scientific accountability.

Accountability will be affected if NSF's decisions to award funds for a certain scope of work are changed by researchers who end up doing work in other areas. The relatively small size of most OPAS actions make it unlikely that any changed a grant's work scope. However, several OPAS actions on the same grant could have a cumulative effect that might affect the grant's work scope.

For example, at one university, after several consecutive budget change requests for equipment purchases had been approved for one grant, the university-wide layer of the OPAS questioned a further request for another rebudgeting action to purchase equipment because it believed the cumulative effect of all these requests might have changed the direction of the research. The OPAS consulted with the chairman and they decided to ask the researcher to solicit NSF's opinion on these changes. NSF had no problems with the changes and the OPAS approved them. At another university, the OPAS specifically reviews the actions' effect on a grant's scope when the requested change is in an area reserved for NSF approval. For example, the university considers a change of time expenditures approaching 25 percent of the amount budgeted as having a possible impact on the scope of work. The university would send these requests to NSF for their approval.

Our review of OPAS actions found only one grant where a researcher had rebudgeted over 25 percent of his grant funds. The researcher rebudgeted 32.3 percent of his funds to purchase equipment. We believe having to report all cumulative OPAS actions that exceed 25 percent of a grant's budget is warranted by the increased accountability provided when NSF reviews these actions.

CHAPTER 3

PHASE II EXPANSION

Phase II both expands and modifies the Master Grant phase. Phase II expands the prior approval authorities delegated to the OPAS from the chemistry department to all university research departments having NSF grants. Phase II modifies the experiment by substituting the concept of relatedness for aggregation. The aggregation concept grouped grants together under one master grant for administrative purposes because they were awarded by NSF's Chemistry Division to a university's chemistry department. The relatedness concept allows funds to be committed or expended from a research grant for allowable costs incurred on other scientifically related grants.

The OPAS remains the key feature of the experiment and its functions become even more critical in Phase II. The OPAS will continue to review and approve researchers' requests to assure that delegated authorities are exercised properly. In addition, the OPAS is responsible for reviewing and approving requests to relate research grants. This additional responsibility will require the OPASs to have the scientific expertise necessary to review and approve requests to relate research grants.

RATIONALE FOR CHANGE TO PHASE II

NSF decided to expand to Phase II on the basis of information it developed during the first few months of the experiment. NSF decided that while the results were encouraging there was a need to introduce some basic changes in the experiment. The changes NSF identified included the need to reconsider the use of the master grant mechanism and the aggregation concept.

NSF officials said the master grant mechanism was too cumbersome administratively within NSF. An NSF official noted that the master grants required a new system overlaying the standard system, required more effort and paper processing, and caused significant problems identifying and converting existing awards, and that it was difficult for NSF's Management Information System to accommodate the changes. Because of these problems, expansion of the experiment to other NSF program areas was considered doubtful.

NSF officials found that there had not been many fund transfers under the aggregation feature of the master grant. They said that the delegated authorities for pre-award costs and no-cost extensions reduced the number of gaps in funding which eliminated many of the situations where they expected fund transfers to be used. An NSF official added that the 2-year award period for master grants limited fund transfers between grants since funds could not be transferred between master grants.

Also, some concern was expressed within NSF about the aggregation concept, which was viewed as giving too much flexibility in using grant funds among otherwise unrelated grants.

NSF officials also said the relatedness concept offered benefits beyond the aggregation concept. They noted that aggregation focused on all researchers in a department that had a grant from the Chemistry Division. NSF discovered that most audit exceptions for cost transfers usually involved individual researchers with multiple grants. Aggregation could not help many of these researchers because their grants were from different NSF divisions and/or other Federal agencies. Therefore, NSF believed that by shifting from aggregation to scientific relatedness the experiment could reduce many of the present problems associated with audit disallowances for cost transfers between a researcher's related grants. An NSF official said that the relatedness concept is an attempt to resolve some of the time and effort reporting problems universities are having implementing revised OMB Circular A-21. He said relatedness should have a positive effect on resolving researchers' problems in allocating their time among related research grants.

Additionally, NSF officials believed the concept could eventually be used for related grants awarded by other Federal agencies. An NSF official said relatedness can be used on an interagency basis as long as the restrictions involved in maintaining separate congressional appropriation accounts are maintained.

THE RELATEDNESS CONCEPT

Although NSF has not specifically defined relatedness, it developed parameters which an OPAS can use to help determine "commonality of research," i.e., the circumstances under which the scopes of two or more grants can be regarded as a single scope for research management purposes. NSF General Grant Conditions for Phase II provide the following examples: (1) the theoretical approaches of grants are related, (2) studies of the same phenomena are conducted by the same or different techniques; studies of different phenomena are conducted by the same techniques, and (3) specific instrumentation, which is central to the work being performed, is used. We believe the OPAS must have the scientific expertise necessary to review and approve requests to relate research grants.

Once two or more grants are related, funds may be committed or expended from one grant for allowable costs incurred on other related grants during the grant period. An NSF official said that some grants may be excluded from using the relatedness concept. He said these exclusions would be determined jointly by NSF program and grants officials.

The OPAS makes the only determination of relatedness if an individual researcher wants to relate two or more NSF grants. If two or more researchers want to relate their grants, the OPAS has to approve the request and the approved request must then be sent to NSF's Division of Grants and Contracts. That division discusses the request with the cognizant NSF program officers. NSF approval is automatic if it does not reject the request within 30 days after receipt.

Reporting expenditures for related research grants

Researchers are required to report expenditures for each NSF grant on the Federal Cash Transaction Report (discussed on page 65). For two grants which are determined to be scientifically related, expenditures from the funds of one grant to assist another grant are reported to NSF as having been charged to the assisting grant. In other words, expenditures made for related research grants are reported to NSF as having been spent on the grants they were awarded for, not on the grants they were actually spent on. Although the total spent on the related grants would be accurate, the actual amount spent on each individual grant could not be determined. Therefore, under the relatedness concept, there will be some loss of financial accountability for individual grants that are scientifically related. For example, suppose a researcher has two $50,000 NSF grants, A and B. If the researcher related the grants and spent $5,000 of grant A funds to buy a piece of equipment for grant B, he or she still reports the funds as having been spent on grant A.

IMPLEMENTING PHASE II AT THE UNIVERSITIES

The nine universities participating in the Master Grant phase expanded to Phase II by June 1, 1981. In addition, three other universities entered the experiment beginning with Phase II. The number of departments with NSF grants and the number of researchers with two or more NSF grants are listed in table 6.

PHASE II OPAS STRUCTURES

The Phase II OPASs varied slighty from the master grant OPASs at the five Master Grant phase participants that had expanded to Phase II while we were still reviewing the master grants. Four of the universities had multi-layer OPASs and one had a single layer OPAS. At least one of the three additional Phase II participants is experimenting with a different OPAS structure.

Multi-layer OPAS

Three of the multi-layer OPAS universities plan to use, with some slight variations, the same multi-layer OPAS structure and procedures as used in the Master Grant phase. The department chairmen will review relatedness requests for scientific propriety. Once relatedness has been determined, a researcher can allocate costs to either grant without further OPAS approval. However, relatedness is not a blanket authority and researchers

Table 6

Profile of Phase II Universities

University	Entered Phase II	No. of University Departments with NSF Grants	No. of Researchers with Two or More NSF Grants
Master Grant Participants			
1) A	1/1/81	53	41
2) E	2/1/81	29	28
3) D	3/1/81	6	30
4) C	3/1/81	31	15
5) G	3/1/81	35	71
6) H	3/1/81	a/	9 b/
7) I	4/1/81	a/	52 b/
8) B	6/1/81	55	41
9) F	6/1/81	40	33
New Participants			
10) Princeton	1/1/81	22	20 b/
11) Stanford	3/1/81	42	46 b/
12) Yale	3/1/81	37	26 b/

a/University was not included in our review--data not readily available.

b/NSF's Office of Audit and Oversight "Report on Audit and Oversight AAU-NSF Experiment in Grant Administration," OAO-81-1166, June 29, 1981.

will have to obtain OPAS approval for those delegated authorities needing prior approval. For example, equipment purchases over $1,000 not approved in either related grant budget require OPAS approval.

Two of the three universities' chemistry departments plan to keep separate accounts for each individual grant's relatedness expenditures to maintain accountability for internal use. Other departments at these universities had not determined at the time of our review how they would account for expenditures among related grants.

The fourth multi-layer OPAS university that expanded to Phase II plans to use two systems. Departments with three or more active NSF grants would use the Master Grant phase system. Departments with less than three NSF grants will be allowed to use a less formal system, i.e., they can use just the department chairman instead of a committee for the first layer of review or they may combine with another department. The two university-wide layers will still review and approve all requests. As at the other three universities, once relatedness has been determined, researchers can allocate costs to either grant without further OPAS approval as long as the specific action does not otherwise require prior approval.

A university official said individual grant expenditure records will still be maintained, although they may not be accurate on an individual basis because of expenditures for related grants. The official noted that the aggregate records should be correct. For example, a researcher may initially estimate spending 20 percent of his or her time on grant A and 30 percent on grant B, whereas the percentage may actually be reversed. If the researcher relates the grants, no adjustment is needed for the variance of actual to projected time since the total effort on the two related grants is still 50 percent. However, he stated that expenditures for each individual grant will be misstated, but this becomes moot since under the relatedness concept the focus is on the total expenditures of both grants.

This same university official said a researcher who has related a grant to another researcher's grant may nevertheless want to know which expenditures have directly benefited his or her own portion of the related research. However, he pointed out that this individual grant focus is contrary to the spirit of the relatedness concept. As a result, any such records will have to be maintained by the researcher since it will not be provided by the university's accounting system.

Single layer OPAS

The university with the single layer OPAS structure that expanded to Phase II while we were reviewing the Master Grant phase plans to use two OPAS structures to implement Phase II. Departments will be assigned to either Type I or Type II structures based on (1) departmental resources for administration, (2) NSF grant volume, and (3) administrative experience. Type I departments will follow the master grant OPAS procedures, i.e., only the department chairman's approval will be required for most authorities. Type II departments will have actions approved by both the department chairman and the university's director of grants and contracts. In addition, an administrative staff person will review all requests after they have been approved.

This university plans to handle expenditures for related grants differently from the other four universities. Each expenditure for related research grants must be approved by the OPAS on a transaction by transaction basis. A university official said relatedness must be determined based on each requested action. For example, just because two grants were related to enable a researcher to purchase a piece of equipment for one grant does not mean that the grants are related for other types of expenditures. As a result, each OPAS request must be evaluated separately. At the other universities, once two grants are related, the grants are treated as if their scopes of work are combined. Therefore, expenditures may be allocated to either grant without an OPAS request. A university official said that a researcher may request that type of relatedness, i.e., where the work scopes are combined, but he does not expect it to happen very often. The official said the researcher would have to provide a very detailed explanation to have that type of relatedness approved.

This university is also experimenting with the documentation of its Phase II OPAS actions. The university and NSF agreed that the documentation of OPAS reviews required by NSF policy may be construed to consist of the identification of the decision and signatures of responsible officials certifying that the request has been reviewed for all NSF requirements. University documents note:

> "...the review depends on a communication, between the [researcher] and those whose approval is required, which identifies the proposed action and the reasons for it. This communication need not be written, but the documentation of the review must certify that the...basic review criteria have been responsibly considered. The review will also involve reference to the grant account and grant file."

Therefore, the documentation of this university's OPAS actions does not have to contain the reason for the action.

Additional Phase II participants' OPAS structures

NSF was not sure of the OPAS structures at two of the three additional Phase II participants even after the experiment's authorities had been delegated to the participants. An NSF official said that one and perhaps two universities only involved in Phase II are experimenting with another type of OPAS structure, one that does not include the department chairman. At one of these universities, the OPAS consists of a single official, independent of the scientific departments, who is responsible for reviewing and approving OPAS actions. The NSF official said that officials at the second university were discussing eliminating the department chairmen from their OPAS and having a structure similar to the one just discussed. The official said he would not know for sure until the university sent copies of its OPAS actions to NSF (the general grant conditions for Phase II do not require NSF approval of OPAS; in fact, they do not require the universities to send a description of the OPAS to NSF).

An NSF official said the third university involved only in Phase II is using a multi-layer structure including the department chairmen and at least one official independent of the scientific department. The official said that although he does not know the exact nature of the OPAS structure, he has assured himself that each of the additional universities has a person who is knowledgeable about the experiment and NSF's goals.

RESEARCHERS' AND ADMINISTRATORS' REACTIONS TO PHASE II

Researchers' reactions to the expansion to Phase II were mixed. Most researchers who responded to our questions about the relatedness concept said they would consider using it. One of the major advantages cited by researchers was that relatedness allows them to allocate costs among related grants which many believed would reduce the need to transfer costs. Researchers also noted that the relatedness concept could promote sharing of resources, equipment, and personnel, and that it provides a mechanism to keep research going during funding gaps.

Several researchers had concerns about the relatedness concept. One department chairman said he would not approve relatedness requests because he believes there is potential for senior researchers to pressure junior researchers and that researchers with grants in a deficit position would use relatedness to eradicate the deficit. Researchers at three universities felt that relatedness could be a threat to the competitive nature of the individual research grant system. These researchers said they preferred to be judged on their own merits and that would be difficult if they related their grants.

Several administrators saw promise in the Phase II expansion. They said significant benefits would accrue to a researcher with two or more NSF grants, particularly in reducing the potential for costly audit disallowances. The administrators added that questionable cost transfers will be eliminated when grants are related. They also said that adjustments for variances in time devoted to each of two related grants will not be needed if the total effort chargeable to both grants is the same as originally projected. One administrator noted that lifting the Master Grant phase restriction that funds could not be transferred between master grants would facilitate interactions among researchers. Another administrator was not as enthusiastic, however. He said Phase II would significantly increase the university's responsibilities, drain administrative resources, and that it might be difficult to maintain reasonable control. Several administrators said they did not expect many requests to relate grants.

CHAPTER 4

THE NSF EXPERIMENT NEEDS TO BE BETTER MANAGED AND EVALUATED

Achieving success in an experiment requires good management and evaluation. Good management keeps the experiment on course toward its goals. Proper evaluation begins with designing the experiment and determining its goals in measurable terms; establishing criteria for success, including some basis for comparison such as evaluation of existing conditions against which to measure changes fostered by the experiment; and establishing an independent evaluation team to monitor and assess results of the experiment.

Our review of NSF's monitoring of its experiment raised a number of concerns. NSF started the Master Grant phase without reviewing the existing university prior approval systems. It did not monitor the experiment as well as it could have and started Phase II of the experiment without completing the evaluations of the Master Grant phase universities or the master grant OPASs. Also, at the time of our review, NSF did not have an evaluation plan for Phase II of the experiment.

PRIOR APPROVAL SYSTEMS IN EFFECT BEFORE MASTER GRANTS NOT REVIEWED

NSF said there was little risk in delegating prior approval authorities to the universities participating in the Master Grant phase because the universities already had prior approval systems in place and the delegated authorities applied only to NSF Chemistry Division grants. In 1977, NSF delegated four grant administrative authorities to all NSF grantees provided that they establish an organizational prior approval system. Actions on grants needing the delegated authorities required prior approval before costs resulting from the actions could be charged to NSF grants. The four types of actions were (1) alterations and renovations under $1,000, (2) cumulative expenditures for equipment which exceeded budget amounts by more than 25 percent, (3) cumulative domestic travel expenditures which exceeded 125 percent of amount budgeted, or $500, whichever was greater, and (4) hiring consultants not already budgeted in the grant. The prior approval systems were required to review researchers' requests for actions using the same criteria the future master grant OPAS would use. However, NSF did not review how well these delegated authorities were used before beginning the experiment.

The three universities with single-layer master grant OPASs each removed at least one official (layer) from the pre-master grant OPASs that had provided a review of the actions independent of the scientific departments requesting the actions and that provided a university-wide perspective. One university's master grant OPAS eliminated two layers of review, from the existing prior approval systems. A university official said the two layers reviewed each action for scientific propriety, technical need, and agency and university policy requirements. In addition, one of the two eliminated layers reviewed the grant document to determine if there were any restrictions on the funds awarded. The official said that after several years of experience, one layer reviewed all requests and the other layer reviewed only requests that were denied. The official said the reviews conducted by these two layers were delegated to the department chairman in the master grant OPAS but noted that a person in one of the removed layers reviews every OPAS action to assure it complies with university and NSF requirements. The other two universities eliminated layers that reviewed for compliance with NSF and university policy requirements.

NSF DID NOT CLOSELY MONITOR THE EXPERIMENT

Evidence indicates that NSF did not closely monitor the experiment. According to one NSF official, oversight and monitoring activities included meetings with other NSF officials, and site visits to many of the participating institutions to obtain information useful in conducting and evaluating the experiment. The official said site visits were a significant factor in the decision to move to Phase II and to add other institutions to the experiment. However, as discussed below, we found a number of problems with the way NSF carried out its monitoring role.

Accountability problems at one university not identified

Financial accountability for Federal research grants administered under one university's Master Grant experiment we examined is deficient. In part, this problem emanates from accounting system inadequacies that predated the Master Grant experiment. The university's implementation of the experiment, including the OPAS structure, operations, and documentation, have added to these deficiencies.

The university's master grant OPAS eliminated the review level with a university-wide perspective in its existing prior approval system. The university "grants office" was part of the existing prior approval system. Its review included an analysis of the OPAS action in light of the agency's reporting and other requirements. As discussed earlier, the chemistry department chairman, who was given this responsibility in the master grant OPAS, said he does not review requests for scientific propriety, research relevance, or policy permissibility because to do so would be an insult to the researcher. The chairman also designated an administrative staff person as his official alternate. He told this staff person to put total confidence in the researcher's justifications when reviewing requests.

The potential negative effect on grant accountability caused by this limited OPAS review is demonstrated by the following four actions approved by the university's master grant OPAS. The chairman approved his own OPAS request, without subsequent review, which was prohibited by the master grant agreement. The prior approval system approved a pre-award request, retroactively, which is contrary to the master grant agreements. Although the chairman is opposed to using OPAS to approve foreign travel requests, one was approved by his alternate. The OPAS's failure to properly review a request, indeed its disregard for critically reviewing OPAS requests, may have resulted in a violation of a special grant condition (see p. 31).

The lack of documentation of OPAS actions also weakened financial accountability. Four of the 12 actions did not indicate the scientific reason for the request. Eight of the 12 did not contain sufficient information to permit a proper review. The OPAS review and approval was documented by the official certifying that he had reviewed the request. However, the university's certification did not indicate that all necessary reviews had been made. It states that "[the] request has been reviewed with respect to scientific considerations and to NSF and University policies and is approved." There is no evidence that any review was made for effective utilization of institutional resources or fund availability as was required by the master grant agreement.

The master grant was superimposed on a deficient accounting system. The chairman said there always have been problems in assuring accountability for grant funds. He said his staff reported that the university controller's office is 6 to 7 months behind in charging purchase orders against grants. The system's lack of expenditure controls often permits grants to be charged costs in excess of budgeted amounts. For example, two grants under the master grants which had been expired for nearly a year each had a deficit in excess of $25,000. As a result of the lack of expenditure controls, the chairman believes neither he nor the researchers could assure financial accountability. Weaknesses in the accounting system are further demonstrated by the university's failure to adjust grant budgets for many approved OPAS actions. Revised grant budgets are not normally processed for most OPAS actions.

We found that these deficiencies in the university's implementation of the master grant authorities offered significant potential for weakening financial accountability for research grant funds. Perhaps most serious is the superficial review given OPAS actions by the chairman and his alternates. The lack of a subsequent level of review further contributes to the incomplete assessment of OPAS requests. Without a university-wide official reviewing these requests, NSF and university policy considerations are given little attention. Because of the deficiencies at this university combined with the preexisting accounting system weaknesses, there is little assurance that grant funds are being properly accounted for and expended for authorized purposes.

NSF officials in charge of the experiment did not plan to conduct an indepth review of the university's use of the master grant authorities or the prior approval system before expanding to Phase II, even though the Director of the Office of Audit and Oversight said in a February 1980 memorandum that he opposed "...any extension of [the delegated authorities at this university] unless a very thorough review justifies placing more confidence in their handling of such matters than appears warranted at the present time."

Special grant conditions were not monitored

When NSF delegated the authorities to the universities, it delegated the responsibilities for monitoring special grant conditions to the OPASs. However, not all of the OPASs were aware of this responsibility. For example, one grant under a master grant had a special grant condition that mandated that specified funds in the equipment line item be used to purchase a laser system. An OPAS action was approved that used some of these funds to buy other equipment. For unknown reasons, the request was submitted to the OPAS twice. The first OPAS official, a designee for the department chairman, was not aware of the special grant condition and approved the request. He said he did not review the award documents to determine if granting the OPAS request would affect special grant conditions. The chairman's signature appeared on the form for the second submission of this request. The chairman said he was overseas at the time and approval was actually given by his administrative assistant. Nevertheless, he said he would have signed the request and not bothered to inquire into the researcher's prior equipment purchases under the grant.

Implementation of Phase II needed better planning

NSF did not closely monitor the implementation of Phase II. The expansion to Phase II was done without finalizing how to administer individual grants under the terminated master grants. Items that still needed to be finalized, after Phase II had already begun, included the expiration date of the individual grants that had been under the master grants and the administration of grants that were in surplus or deficit positions awaiting fund transfers.

Communication between NSF and universities could be improved

Day-to-day communication between NSF and the universities needs to be improved. Although NSF terminated the master grants with one university's State system on March 1, 1981, university officials were unaware of this in early March 1981. Another example of the communication problem was a university's attempt to resolve a problem it had when the master grants were terminated. According to a university official, this university asked NSF if it could continue the master grant format until the grants expired to keep paperwork and confusion to a minimum. However, NSF was not able to arrange this. The official then proposed extending the ending dates of all grants in the first master grant to November 1982 and allowing fund transfer actions on those grants. He said this would relieve a heavy administrative burden in final reporting and allow the university to complete a number of planned fund transfer actions. The university official said it took 3 months to work out the details, but NSF agreed to this plan. The official said that even though there were some problems and confusion associated with the transfer in the chemistry department, the rest of the university, which was not under the Master Grant phase, did not have any problems with the transition to Phase II.

Another example of the lack of communication between NSF and participating universities resulted in one university's not attempting any fund transfers. During a visit to discuss the proposed Phase II, an NSF official gave incorrect information to university officials. The NSF official had reviewed a proposed fund transfer that two researchers had agreed to and noted that the grants were not related. University officials said, based on this interpretation, no more fund transfers would be attempted. However, under the master grant authorities the grants did not have to be related, since they were included in the same master grant.

MORE EVALUATION NEEDED

Some NSF review of the experiment has occurred. However, we believe that not enough has been done to provide needed review.

Master grant evaluations not completed prior to expanding to Phase II

NSF expanded the master grant experiment to Phase II with only a very limited review of the Master Grant phase. The master grant agreements included evaluations to be conducted at the end of 6 months and again at the end of the first year. NSF conducted the 6-month evaluation at only four of the nine universities. The evaluation consisted of questionnaires that were completed anonymously by 44 researchers, and discussions held with researchers, department chairmen, individuals having responsibility for review of transactions under the OPAS, accounting officials, and other administrative support staff. Also, a limited review of documentation and other records pertinent to the experiment was made.

The results of the 6-month evaluation were summarized by an NSF official as follows. Delegations of the prior approval authorities were used less than NSF expected in that the universities were conservative in using the additional flexibility the authorities provided, the greatest use of flexibility was in purchasing equipment, and the time savings on hiring and obtaining approvals for starting a grant were found to be important. The researchers' concerns about being dominated or ripped off did not materialize--the prior approval systems required their approval for changes affecting them, cooperation among researchers was encouraged, and the researchers' communication with NSF program officers was apparently not reduced.

The 6-month evaluation recommended that agreements be modified to expand the OPAS delegation of authority feature to all departments at the four universities included in the evaluation, since the universities had demonstrated the ability to manage this activity properly and the OPAS delegations had produced significant efficiencies in grant management. The recommendation included the provision that this expansion would be made only to the extent that the universities considered it feasible and that they would submit modified OPAS descriptions to assure that appropriate controls were in place on a larger scale.

The evaluation report also recommended expanding the Master Grant experiment at chemistry departments to include all NSF-funded grants, not just those from the chemistry division; expanding the full experiment to the universities' engineering departments, and including all NSF grants to the engineering departments. In addition, the report contained an additional recommendation suggested by one of the members of the review team to explore concepts of relatedness that could provide research management flexibility without the master grant concept of aggregation. No immediate action was taken by NSF on any of the specific recommendations.

NSF did not conduct the 6-month evaluation at the remaining five schools and did not conduct any first-year evaluations at any of the nine schools. According to NSF officials, they did not complete the evaluation because they had determined that the master grant OPAS mechanism was working, and if it worked for the chemistry departments at four universities, it would work everywhere else. Also, the first evaluation led NSF to develop information on the relatedness concept and the problems researchers encounter with allocating costs among grants.

We assessed NSF's 6-month evaluation and found the following problems. First, NSF's evaluation report noted that 6 months was not enough time to make an indepth evaluation of such a complex experiment. Second, the evaluation was conducted by the team running the experiment. Third, the evaluation was based mostly on questionnaires and interviews. Fourth, only limited reviews were made of OPAS actions or of accounting records supporting charges to individual grants. NSF's evaluation report noted that these reviews were essentially informal in nature, consisting primarily of discussions with university personnel and a cursory examination of the underlying records.

Little evaluation of universities' OPASs prior to expanding to Phase II

Under the experiment, NSF delegated certain powers to the universities that ordinarily would be exercised by NSF officials. As a condition of NSF's delegation, universities were required to have OPASs to assure that the delegated powers were exercised properly. NSF viewed this as the way to maintain (or possibly increase) grant fund accountability while also reducing Federal intrusion and red tape related to NSF grants at the universities. The OPASs were the heart of the grant administration experiment since they exercised the newly delegated powers and were intended to assure proper accountability over NSF grant funds.

Given this, it would seem that the most important aspect of any evaluation of the experiment would include a thorough review of the OPAS at each university participating in the experiment before the experiment was expanded at each university or expanded to other universities. In fact, before the expansion to Phase II, the Director of NSF's Office of Audit and Oversight wrote to the NSF official responsible for the experiment that: "...a thorough review of demonstrated administrative responsibility is a sine qua non for any extension of the delegation of authority either to the current list of Master Grant institutions or to others."

However, NSF did not conduct this type of evaluation and decided to expand to Phase II without evaluating the adequacy of the existing OPASs at the universities. Also, the three additional Phase II participants, which had no operational experience with the Master Grant phase of the experiment, were not reviewed to determine if they could handle the experiment. Even after 3 months of participation, the NSF official in charge of the experiment was not sure of the OPAS structures of two of the additional participants.

Responsibility for audit of experiment's grants

NSF's response to our draft report stated that NSF did not assume responsibility for the audit of all grants under the experiment and that this responsibility remains with the cognizant audit agencies. Our draft report stated that NSF had assumed responsibility for the audit of all grants under the experiment at the participating universities. This information was based on interviews with NSF officials where we were given information contrary to NSF's current position. NSF statements to us led us to believe that NSF had responsibility for auditing NSF grants at the institutions participating in the experiment. We do not object to the cognizant audit agencies having responsibility for auditing NSF grants at the participating institutions and have deleted our draft recommendation in light of the additional information NSF provided.

NSF review of experiment

In July 1980, an NSF official noted that NSF did not have a formal plan to evaluate the experiment at the nine universities. He said NSF would be conducting an audit and that NSF audit officials were working on audit guidelines and the schedule for visits. He noted that each university's system would be evaluated before it is given expanded OPAS authorities; however, the question was how to do the evaluation. An NSF audit official provided us with a copy of their audit guidelines and the dates visits were planned.

In March 1981, an NSF official said that the planned audit was not an audit or an evaluation but an abbreviated review aimed at presenting information to help structure the future Phase II evaluation. Researchers were interviewed on the relatedness concept and how they viewed the OPAS and the types of documentation OPAS required. NSF issued a report on the audit dated June 29, 1981. The report said that reviews were conducted at eight of the master grant universities. The report said the reviews were limited primarily to examining the actions taken under the OPAS, documentation supporting these actions, and interviews with researchers and other grantee personnel to determine their views on the concept of the relatedness of research projects. The report also contained some statements on the evaluation of Phase II. It stated that:

> "[NSF] will make an evaluation of the results of Phase II after each institution has had significant experience. The evaluation will be structured to include participation by NSF representatives from the Division of Grants and Contracts, Office of Audit and Oversight, and the program offices to assure that all relevant elements of NSF have input since the evaluation could result in the development of new or revised NSF policies and procedures. In our opinion, the evaluation should be made before any decision is reached to apply any new provisions to NSF grants at all qualified colleges and universities."

Phase II began January 1, 1981. NSF officials said in March 1981 that they planned to develop a Phase II evaluation plan during the next 4 to 5 months. They said they expected their Phase II evaluation to begin sometime in fiscal year 1982. However, according to an NSF official, the Phase II evaluation plan had not been prepared at the time of our review.

The report on NSF's audit provided the only evaluation information on the experiment besides the report on the review performed at four universities after 6 months under the Master Grant phase. While both reports contained useful information, neither showed that a thorough evaluation, conducted by persons not directly involved in the experiment, was done. For example, neither report identified problems in the single-layer OPAS structure that we found. In fact, neither report indicated that the OPAS, which is the key to the experiment, was thoroughly evaluated. In addition, while both reports indicated that some documentation for OPAS actions had been examined, neither found the documentation problems we identified. With the change to scientific relatedness and its potential for use by other Federal agencies, the OPAS and its documentation become even more critical for maintaining accountability for Federal research grant funds.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

We believe the experiment can improve Federal-university relationships, increase the efficiency and economy of Federal research grant administration, reduce the flow of paper between the universities and NSF, and provide universities and researchers more flexibility in the use of grant funds. Although we found some operational problems which could adversely affect the experiment's success, we believe that with the changes suggested in this report, the new approach to research grant administration employed in the experiment will have a beneficial effect on the future administration of Federal research grant funds. The cognizant congressional committees should be aware that there is a limited loss of financial accountability for individual research grants when expenditures are made for related grants. We stress that the experiment should not be expanded further until a thorough evaluation is completed, the results assessed, and essential improvements made.

The experiment redirects the focus of research grant administration from NSF to individual universities and researchers, reduces NSF involvement in grant administration, and recognizes the scientific relatedness of researchers' grants. The Phase II authority, which allows research grants to be related on a scientific basis, has the potential to increase further the economy and efficiency of research grant administration. Relatedness should make it easier for universities and researchers to account for costs among scientifically related grants and eliminate the need to make cost transfers between scientifically related grants. This should reduce problems caused by Federal auditors disallowing cost transfers.

THE MASTER GRANT PHASE'S EFFECT ON RESEARCH GRANT ADMINISTRATION

We believe that the Master Grant phase of the experiment met its objectives of increasing the efficiency and economy of research grants supported by NSF. Delegating more decision-making authority to the universities allowed researchers to manage their grants more efficiently and economically. Less time and effort was required to obtain changes in grant budgets, pre-award costs were permitted to allow grants to start more promptly and efficiently, and researchers were given the ability to respond flexibly at the local level to changing grant needs.

The Master Grant phase had little effect on paperwork at the universities because OPAS actions still had to be documented to assure accountability. At NSF, paperwork increased since the master grants required a new administrative system overlaying the standard system, although some of this increase was probably a one-time effect due to the experiment. However, the experiment did lead to some reduction in the flow of paper between the universities and NSF since grant administrative changes are now reviewed and approved by the universities' OPASs.

The Master Grant phase did not meet its objective of increasing accountability for Federal grant funds. We identified several areas where better controls are needed to assure adequate accountability. We found that OPASs with a review layer independent of the research department initiating the request better assured that the actions were properly reviewed. We also found that documentation for some OPAS actions did not contain sufficient information to determine if applicable policies and procedures had been followed.

Accountability will suffer if NSF decisions to award funds for a given scope of work are circumvented by researchers doing work in other areas, if grants with special grant conditions are not closely monitored to assure OPAS actions do not violate the special grant condition, and if OPASs approve actions after they have already been taken. To preclude possible Anti-Deficiency Act problems, applicable NSF regulations or the grant agreements should make it clear that the approval process cannot impose an obligation on the United States prior to the availability of an appropriation to fund the costs. We believe these problems will be applicable to Phase II of the experiment and we have made several recommendations which, if implemented, should help maintain accountability for NSF research funds in the future.

PHASE II HAS ADDITIONAL BENEFITS

The Master Grant phase benefits derived from delegating prior approval authorities for grant budget changes should continue to accrue during Phase II. The benefits of university approval of the pre-award costs should also continue. The local OPAS remains the key feature and it should continue to allow researchers to manage their NSF grants more efficiently and effectively.

The new Phase II authority to charge expenditures to one grant that were incurred for another related research grant should provide additional benefits. Relating research grants will increase the researcher's flexibility in allocating costs among scientifically or technically related grants. Being able to more easily allocate costs should decrease the need to make cost transfers between grants. Relatedness should, at a minimum, eliminate nearly all cost transfers between related grants of an individual researcher. The effect of relatedness could be greater if two or more researchers begin to relate their grants. By eliminating many cost transfers and thereby reducing the audit resolution problems, the morale of the university researchers and administrators might improve. The recognition of the interrelationship of a researcher's grants and the reduction of the intrusion of Federal red tape could produce a better atmosphere for research. However, the benefits of the Phase II relatedness concept should be weighed against the limited loss of financial accountability for individual research grants.

Two additional potential benefits of Phase II relatedness are also evident. The recently revised OMB Circular A-21 has caused problems for universities attempting to implement the Circular's time and effort reporting requirement. Relating research grants should reduce and possibly eliminate a researcher's problems in allocating time and effort between related grants.

Relatedness could potentially be used by other Federal agencies in the future. An NSF official said it could be used on an interagency basis, as long as the restrictions involved in maintaining separate congressional appropriation accounts are maintained. While Federal agencies would continue to award funds on a discrete grant basis, the researcher would be free to manage his or her research funds in the most economical and efficient manner.

CHANGES ARE NEEDED IN PHASE II TO IMPROVE THE EXPERIMENT

We identified several problems in the experiment which, if corrected, will help NSF to maintain the necessary accountability for Federal funds. Our four concerns are that (1) several OPAS structures either do not provide an independent level of review or may not provide the necessary scientific expertise, (2) the documentation of some OPAS actions will not provide the information needed to assure accountability, (3) NSF needs to improve its monitoring of the experiment, and (4) NSF needs to develop and implement as soon as possible an evaluation plan to be performed by an independent team.

An independent level of review and scientific expertise

At least one university's Phase II OPAS structure does not include a review layer independent of the department initiating the request. To assure that each department is exercising the delegated authorities properly, we believe the OPAS should include an official independent of the department initiating the request.

NSF requires that all OPAS requests be reviewed for scientific, technical, and/or managerial need and propriety. At least one Phase II OPAS does not include the department chairman and may not have the scientific expertise necessary to review OPAS requests. This expertise is critical for requests to relate research grants since approval depends on the scientific or technical commonality of the work. We believe that each OPAS should have or have available the expertise necessary to provide the scientific review that NSF requires.

Adequate documentation of OPAS actions is essential

Documentation of OPAS actions is an important means of ensuring accountability for NSF grant funds. NSF is experimenting with requiring just the identification of the OPAS action and the signatures of the OPAS officials certifying that it has been reviewed for NSF requirements. We believe that certification without documentation of the reason for the action is not adequate.

The Master Grant phase allowed the documentation of OPAS review and approval at three universities to consist of identifying the decision and showing that it has been reviewed for scientific or technical need and propriety, research relevance, effective utilization of institutional resources, policy permissibility, and fund availability. We found that when the scientific, technical, or administrative reason for the action is not documented, it is impossible to review that action to determine if applicable policies and procedures have been followed. Accountability could decrease since it would not be possible to determine if the action was appropriate.

In addition, NSF has reserved the right to withdraw a university's delegated approval authorities if the university mismanages these authorities. In order to determine whether the universities have mismanaged the authorities NSF must be able to review the OPAS decisions, especially the reasons why they were made. This will not be possible if the reasons for OPAS actions are not documented.

Monitoring the experiment

NSF needs to do a better job of monitoring the experiment. The systems universities use to exercise the newly delegated powers which were intended to assure proper accountability over NSF grant funds are the heart of the experiment. For this reason, it would seem reasonable that NSF would thoroughly review both these systems and the systems that preceded them at each university before delegating or expanding the grant administrative authorities. However, NSF did not conduct this type of review.

NSF could have done a better job monitoring the experiment to assure that it was on course toward its goals. Based on our review, we found that accountability for grant expenditures was a problem at one university participating in the experiment, that special grant conditions were not monitored, that Phase II began without finalizing how to administer individual grants under the terminated master grants, and that communication between NSF and the universities needs to be improved.

NSF should assure that the universities are informed of the changes, modifications, etc., to the experiment in a timely manner; closely monitor the universities' use of the experiment's authorities to assure that delegated authorities are used properly; and review the OPAS policies and procedures for each participating university to assure that the OPAS meets NSF's requirements for policies and procedures before the authorities are delegated to the university.

An evaluation plan

NSF needs to improve its evaluation of the grant administration experiment. At the time of our review, NSF had not developed its evaluation plan for Phase II. Phase II needs to be thoroughly evaluated by an official or team independent of those managing the experiment before any consideration is given to expanding the experiment further. The OPAS mechanism should be the focus of the evaluation. Because of the potential effect on future Federal grant administration policies, NSF should not expand the experiment further until the evaluation is complete and the results are assessed.

FINANCIAL ACCOUNTABILITY FOR INDIVIDUAL GRANTS

NSF's experiment in grant administration permits researchers with NSF grants at participating universities to spend funds from one NSF grant on other scientifically related NSF grants. However, the funds will be reported to NSF as having been spent on the grant they were awarded for, not on the grant they were spent on. That is, funds spent for one grant can be reported as having been spent on another. Some financial accountability for individual grants will be lost, since the actual expenditures for each related grant might not be the same as the expenditures reported.

RECOMMENDATIONS

We recommend that the Director of the National Science Foundation take the following actions to preserve the experiment's potential to improve research grant administration, while at the same time assuring that there will be adequate accountability for Federal research grant funds.

--Require that each university's OPAS have an official independent of the participating departments who can assure that each department is exercising the delegated authorities properly, and who has or has available the scientific expertise necessary to review and approve actions.

--Require that NSF review each university's OPAS to assure that the university has established a system that can act responsibly before any delegations of prior approval authorities are made.

--Require that all OPAS actions document (1) the description of the request, (2) the scientific reason for the request, and (3) the source of the funds being rebudgeted, for rebudgeting actions on grants with special grant conditions.

--Require that (1) each university report to the cognizant NSF official all OPAS actions on any grant whenever the cumulative OPAS actions (excluding pre-award costs) exceed 25 percent of the grant's direct costs; and (2) NSF assure that each participating university is aware that its OPAS is responsible for monitoring all actions on grants with special grant conditions.

--Require that retroactive approvals of actions needing prior approval (1) document the reasons why prior approval was not obtained in a timely manner, and (2) certify that approval would have been given had the request been submitted on time.

--Develop a Phase II evaluation plan and assure that the necessary resources are available to carry it out. The evaluation should include a thorough review of each university's OPAS policies, procedures, and actions, and be conducted by official(s) independent of those managing the experiment.

--Closely monitor the universities' use of the experiment's authorities and provide those responsible for managing the experiment at the universities with information on changes, modifications, etc., to the experiment in a timely manner.

--Ensure that applicable NSF regulations or grant agreements explicitly provide that the authority to approve pre-award costs cannot impose an obligation on the United States prior to the availability of appropriations.

AGENCY COMMENTS AND OUR RESPONSE

NSF and OMB reviewed and commented on a draft of this report. NSF generally concurred with the conclusions presented in our report, and believes the report should improve the prospect that the experiment's concepts will be given favorable consideration by the Congress and other Federal agencies. NSF divided its comments into three categories: (1) general comments; (2) comments on our recommendations; and (3) suggestions on "apparent" errors. The general comments are comments and suggestions on what NSF perceives to be improvements or clarifications that could be made in the report. In comments on our recommendations, NSF agreed with or planned to consider most of our recommendations. It provided additional information contrary to that previously given to us which affected two recommendations. The recommendation regarding special grant conditions originally required that each university provide information to NSF to allow it to monitor these conditions. It has been revised to allow OPASs to be responsible for assuring that special grant conditions are not violated. The recommendation requires that NSF assure that each participating university is aware of its responsibilities. We deleted the other recommendation. It is no longer necessary to recommend that NSF provide adequate audit coverage for the experiment's grants or return the responsibility to the cognizant audit agencies since NSF informed us that the cognizant audit agencies currently have this responsibility. The recommendation regarding ensuring that pre-award costs do not impose an obligation on the United States prior to the availability of the appropriation was added to the report after NSF had officially commented on the draft. NSF has not had the opportunity to comment on it.

The list of suggestions on "apparent" errors provides additional information or clarifications NSF wanted us to incorporate into the report and we have generally done this. Their comments and our responses to them are in appendix I.

OMB agreed with the basic conclusion of the draft report that the NSF experiment can have important benefits in terms of eliminating red tape and improving Federal-university relations. OMB's comments clarified its position on the relatedness concept's effect on accountability. These comments and our responses to them are in appendix II.

NSF'S COMMENTS AND GAO'S RESPONSE

NATIONAL SCIENCE FOUNDATION
WASHINGTON D.C. 20550

OFFICE OF THE
DIRECTOR

April 16, 1982

Mr. Morton A. Myers, Director
Program Analysis Division
United States General Accounting
Office
Washington, D.C. 20548

Dear Mr. Myers:

We are responding to your letter of March 18, 1982, asking for comments on your draft report on the "AAU-NSF Experiment" in grant administration.

We are pleased GAO found that delegation of prior approval authorities to university OPAS systems increases the efficiency and economy of research grant administration, and that the relatedness concept increases the researcher's flexibility in allocating costs among scientifically or technically related grants, and could reduce problems with cost transfers and time and effort reporting.

We are especially pleased that GAO and OMB staff regard this initiative as promising. Your report should improve the prospect that it will be given favorable consideration by the Congress and Federal agencies. Your suggestion that the cognizant Congressional committees consider the concept of relatedness is important because its full value will only be realized if all Federal agencies which support research use it.

On page 1-7 GAO notes that it undertook its review because of the increasing concern for how Federal research grant funds are administered and the experiment's potential effect on accounting for these funds. The AAU-NSF experiment was undertaken in the belief that the key problem in Federal-university relations is not how grant funds are administered, but is, rather, that disagreements over financial accountability are caused by an inadequate definition and understanding of the basic grant relationship. As the National Commission on Research noted, the deterioration in Federal-university relations is associated with fiscal and administrative problems. These problems led NSF to experiment with redefining the basic relationship by questioning, for example, the traditional procurement-oriented notion that costs of research can and must be precisely allocated to individual grant projects. The experiment is testing a modest modification of that notion by assuming that the Government often is supporting an individual project which is a part of a researcher's ongoing program of research. Less financial precision in allocating costs to individual projects is not necessarily less accountability. Indeed, it may well be that clarifying roles and responsibilities and providing better criteria for the decisions that OPAS systems make, can contribute to more effective allocation of resources and to clarifying both Federal and grantee accountability, financial and otherwise.

In the three enclosures to this letter we address ourselves to your comments on the project and your recommendations. Our comments are of three types: (1) general comments and suggestions on what we perceive to be improvements or clarifications that could be made in the report; (2) comments on specific GAO recommendations; and (3) a listing of apparent errors in the report that you may wish to correct.

We appreciate the opportunity to comment on the draft report. The "experiment" and your report on it should lead to further consideration of these important issues.

Sincerely yours,

John B. Slaughter

John B. Slaughter
Director

Enclosures

ENCLOSURE 1

General Comments

1 The GAO comments on the management of the experiment assume that the experiment should have been conducted with a degree of rigor that we believe would have been counterproductive. GAO asks for goals that can be specified in measurable terms so that changes and results can be measured. The experiment is in policy development and involves a multitude of variables. It is different from an experiment in which hypotheses can be formulated with such precision that the data will give a measurable yes or no answer. In the experiment we tried an approach, modified it to deal with the problems it caused, and now find that those modifications seem to have produced a successful result. It is not methodologically sound to state that the experiment should have been conducted in a more rigorous fashion.

2 In the experiment we have been examining delegations, new types of authorities, OPAS systems, documentation, appropriate roles and responsibilities, criteria for decisions, scientific reviews of decisions. and so on. The report suggests that before Phase II was undertaken, NSF should have approved OPAS systems, emphasized the need for the traditional type of documentation, and required that there be a second scientific approval of scientific decisions. The report's implication that issues, some of which only developed during the course of the experiment, could or should have been resolved before Phase II was undertaken is not consistent with the nature of the experiment. Even with Phase II, we may not have sufficient data or experience to resolve all these issues to everyone's satisfaction. We believe the report should recognize that these are important issues that should be resolved as soon as possible, not that they should have been resolved before the experiment was completed.

3 Page 4-9 of the draft report suggests that NSF should have completed the evaluation of the master grant phase before moving to Phase II. As the report notes, there were a number of problems with the master grant concept. When these were recognized, the master grant approach was discontinued. Phase II used the same concepts as in the master grant, with the substitution of "relatedness" for "aggregation." We believe that continued evaluation of the master grant approach would not have been productive. After discussions with the participating institutions, we concluded that the Phase II approach had a high probability of success, so NSF expanded the experiment to generate more data by including essentially all NSF grants at the participating institutions. The number of OPAS actions in the master grant phase was much smaller than had been anticipated. We also added three institutions that we believed would be especially useful to us in reacting to the concepts being tested.

4 Page 4-12 of the draft report suggests that there should have been more careful review and approval of OPAS systems before Phase II of the experiment was begun. Throughout the experiment we have been evaluating OPAS systems. Not only are different systems needed in different institutions, but OPAS systems are a variable in the management of research. The functioning of an OPAS is so intertwined with questions of required approvals, documentation and justification that we wanted to learn from grantees' experiences with different OPAS systems rather than prescribe a priori what such systems should be. Therefore, in Phase II NSF did not want to prescribe or specifically approve OPAS systems in advance (though they were discussed with participants). We consciously chose to encourage the institutions to use their best judgment in developing OPAS systems that would most effectively serve the purposes of research management, so long as key university officials understood the purposes of the experiment and the OPAS met the requirement that there must be an independent review of investigator-initiated actions. Only now, with the review of large numbers of OPAS actions, does it make sense to begin to define what minimum OPAS responsibilities should be. We expect to do that in the near future. Interestingly, some participants have made changes in their OPAS systems based on their experience during Phase II.

5 Page 5-6 of the draft report suggests that NSF should have been requiring more documentation and should not have been permitting use of certification at one institution. Again, these suggestions are inconsistent with the fact that we are experimenting with documentation and certification. The amount and nature of documentation is one of the variables we are trying to examine. In any future implementation, we hope to be able to specify what documentation is necessary for various types of approvals, and under what circumstances a form of certification might be acceptable.

6 Page 4-8 of the draft report suggests that NSF management of the project should have provided more information and guidance to participants. The example used was the case of one participant which had difficulty converting from the master grant phase to Phase II, and asked for detailed guidance on how to manage the transition. That was the only participant which had that type of problem. NSF staff consulted with this institution and concluded that the problem was one of rigidity in its accounting system. They were told that they, not NSF, were in the best position to handle the problem and, consistent with the experiment's intent to enhance grantee responsibilities and capacity, they should handle it, and NSF would ratify any additional approvals that were necessary. They did so, and NSF gave the necessary approvals.

7 Beginning on page 4-3, the draft report presents information indicating some doubt about financial accountability at one university. GAO's concerns were (1) that the university's accounting system was deficient, making it difficult to assure grant fund accountability, and (2) that the OPAS under the master grant phase only provided for approvals by the Department Chairman. With respect to (1), over the years there have been criticisms by federal agencies, generally acknowledged by the university, of some lack of financial accountability at the university. NSF recognized that including the university in the experiment might pose some risk, but concluded that the experiment should not

be limited only to universities having no such difficulties. Because of the concerns expressed by GAO, NSF staff made an on-site review and determined that the institution is making a concerted effort to improve its financial management system. Even so, the financial information in the Controller's Office still was running several weeks behind on a real time basis. However, it was determined that, as is common practice at many institutions, financial information on individual grants is maintained in the departments. This information was reliable and was being maintained in a timely manner. Inasmuch as investigators were relying on this departmental information in making decisions involving the expenditure of grant funds, NSF concluded that OPAS actions would entail no loss of financial accountability for the purposes of the experiment. With respect to (2), it was agreed by representatives of NSF and the university before Phase II began that the university's "Grants Office" would be included in the approval process and would review all actions initiated under the expanded delegation of approval authority.

8 There are several references in the report to the concept of relatedness. While the concept is seen as a means of addressing audit problems -- particularly cost transfers and some time and effort problems -- it nevertheless is cast in a somewhat negative light, i.e., producing a limited loss of financial accountability. For example, in the Digest (p. vii) the report states that "expenditures made for related research grants are reported to the NSF as having been spent on the grants they were awarded for, not on the grants they were actually spent on." Yet on page 1-4 of the report GAO acknowledges that "some costs may be legitimately assigned to more than one source" and that "sometimes a researcher needs to make some legitimate but retroactive reallocation of charges, resulting in cost transfers." The concept of relatedness is based on the premise that investigators pursue a program of research funded by multiple sponsors. The sponsors have an interest in various aspects of an investigator's overall research program and provide support for a portion of that program through an often somewhat arbitrarily defined "project." In carrying out a research program an investigator incurs expenses for supplies, equipment, travel, personnel, and so on. These expenditures often are allocable to two or more of an investigator's projects. The research overlaps and there is no way precisely to measure the benefits that accrue to any project in direct relationship to the expenditure of funds. Consequently, investigators often allocate costs to projects in a subjective manner, sometimes on the basis of the availability of funds. To assume that the concept of relatedness results in a loss of financial accountability is to assume that there is at present a discreteness or separability in individual research projects which does not usually exist. Indeed, the concept of relatedness may reflect reality better than the notion of financial accountability by project that is assumed in the report.

9 Page 4-13 of the draft report states that NSF requested and was given permission by the cognizant audit agencies - DHHS and DCAA - to assume responsibility for the audit of all grants under the experiment. NSF did not assume responsibility for auditing the grants covered by the experiment. We made arrangements with the cognizant audit agencies, in compliance with OMB Circular A-88, to perform site visits to review OPAS systems and determine the

adequacy of documentation. The arrangements did not include provision for NSF to take over the audits of any NSF grants. The audits of all NSF grants continue to be the responsibility of cognizant audit agencies as part of their regularly scheduled audits of universities. However, in meetings with the universities, some of which were attended by representatives of the cognizant audit agencies and GAO staff, we did state that in the event of audit disallowances which could be attributable to actions associated with the experiment, NSF would reserve the right to disagree with any disallowance of expenses associated with any such actions taken in good faith.

10 Finally, inasmuch as the experimental phase of the project is essentially complete, the report should clarify that GAO's recommendations do not solely relate to the conduct of the experiment but are matters that NSF should consider in any implementation.

ENCLOSURE 2

Comments on GAO Recommendations on Pages 5-8 through 5-10

11 The first recommendation, that each university's OPAS include an official capable of providing the scientific expertise necessary to review and approve actions, assumes an answer to a question which NSF is examining. The need for a second scientific review is not as obvious as GAO assumes. In some cases a department chair clearly exercises that responsibility. In many cases, however, it is doubtful whether a department chair has the expertise to do that or is inclined to do so even if he or she does. The chair's review often may be a managerial review, including a check for impropriety. The role of the department chair and the need for a federal requirement for a second scientific judgment are issues which NSF hopes to resolve before any implementation.

12 The second, third and fourth recommendations deal with OPAS systems and actions. NSF regards OPAS systems and the requirements for OPAS actions as variables with which we have been experimenting. In our evaluation we will consider the GAO recommendations in establishing criteria for OPAS systems, how they are reviewed and the type of guidance furnished grantees for their use.

13 We agree with the fifth recommendation, requiring special documentation for retroactive approvals, and expect to follow it in any implementation.

14 The sixth recommendation deals with a Phase II evaluation plan. NSF recognizes the need for an evaluation of Phase II. The NSF Audit Office is performing a limited evaluation of Phase II. The scope includes reviews of participating universities' OPAS policies, procedures and actions with the primary objective of determining the uses being made of the prior approval authorities and the risks associated therewith. The NSF Director also is establishing an NSF ad hoc evaluation committee, made up of NSF officials not directly involved in the experiment, to review Phase II and make recommendations on any future NSF implementation. NSF management will consider the findings and recommendations of the ad hoc committee and the Audit Office, together with information provided by other operating elements of the Foundation and the participating institutions, in deciding on any further actions or implementation.

15 GAO's seventh recommendation, dealing with monitoring the universities' use of the authorities and providing timely information to universities, appears unnecessary in the light of NSF's evaluation activities and the fact that the experiment is essentially complete.

16 The eighth recommendation is not appropriate inasmuch as NSF has not assumed responsibility for auditing any NSF grants at the participating institutions.

ENCLOSURE 3

Suggestions on Apparent Errors

17 The objectives of the experiment as stated on page ii of the digest are so abbreviated as to be misleading. They should be stated as they are on pp. 1-1 and 1-2.

18 Page 1-1, paragraph 2, should note that NSF discussed the nature of the experiment with GAO, some Congressional staff, OMB and others before it began.

19 Page 1-3, paragraph 2, line 2, add after the word research "...on an individual project."

20 Page 1-10, line 17, delete the word "supposed" and substitute "NSF also takes appropriate action..."

21 Page 1-11, line 12, should read "...devote a substantially different amount of effort..." (either up or down).

22 Page 1-17, line 14, the entire phrase beginning "... it is notified ..." should be deleted as NSF does not so notify grantees.

23 Page 2-13, line 10, add "Some of this additional effort was a one-time cost due to the changes."

24 Page 2-16, line 7, add "These examples demonstrate the value of experimenting in exposing difficulties that need to be considered before any implementation."

25 Page 3-3, line 10, should read "...attempt to resolve some time and effort reporting problems..."

26 Page 4-6, the last sentence states that "NSF did not delegate responsibility for monitoring special grant conditions to the OPAS's..." That is not correct. The grantees agreed that OPAS authorities would be exercised except if prohibited by special conditions in individual grants. Thus, to exercise OPAS responsibilities grantees must monitor special grant conditions. Moreover, Article 5(d) of the grant terms and conditions requires that OPAS actions be consistent with the grant conditions. "Grant conditions" include special conditions.

27 Page 5-2, paragraph 2, should recognize that paperwork increases were probably a one-time effect due to the changes.

28 Page 5-9, Recommendation #4 (2), should be changed to recommend that the OPAS

should monitor special conditions.

29 Page 5-10, last recommendation, should recommend only that audit responsibility be retained by the cognizant agencies.

30 On Table 1-1 on page 1-15, no-cost extensions are approved by the NSF Grants Officer. The dollar figure in the reference to alterations and renovations has been increased to $10,000 with the October 1981 revision to NSF F.L. 118. This newly revised F.L. 118 also no longer lists special approvals for news release costs or rental or lease of facilities consistent with changes in A-21. The purchase of general purpose equipment is approved by the NSF Grants Officer, not the OPAS.

GAO'S RESPONSE TO NSF'S COMMENTS

The numbers of the responses below correspond to the numbered paragraphs of the April 16, 1982, letter from John B. Slaughter, Director of the National Science Foundation.

ENCLOSURE 1

1. We believe that NSF needs goals and criteria to assess the effect the experiment's changes are having on research grant administration. We do not agree that determining goals in measurable terms and establishing criteria for success would have introduced a degree of rigor that would be counterproductive. Goals and criteria are needed in any experiment; we believe they could have been established by NSF without unreasonably restricting flexibility.

2. The issues discussed here are critical to the experiment. Although NSF is experimenting with these issues, it still needs to have adequate safeguards to assure that Federal funds are appropriately spent. Detailed responses on these issues are included in our response to points #4, #5, and #11 of NSF's letter.

3. This section of the report, beginning on p. 32, presents the facts concerning only NSF's evaluation of the Master Grant phase. We did not suggest that NSF should have completed its evaluation of the Master Grant phase's aggregation concept. However, we believe NSF should have reviewed and approved the OPAS systems before Phase II began, as discussed in our response to point #4 of NSF's letter.

4. We believe NSF should have reviewed and approved the OPAS systems before implementing Phase II (see p. 34). The OPASs are the heart of the experiment since they are responsible for reviewing and approving the newly delegated authorities and are intended to assure proper accountability over NSF grant funds. Although we agree that NSF need not have prescribed a priori what OPAS systems should have been, we believe NSF should have established minimum acceptable criteria and thoroughly reviewed each system to assure that it had demonstrated the capability to handle the expansion responsibly.

5. We understand that NSF is experimenting with the issue of documentation and certification (see p. 40). However, we believe that when experimenting with certification, NSF should have required backup documentation as a safeguard. Certification does not provide the reason for an OPAS action. It is impossible to determine whether applicable policies and procedures have been followed without knowing the reason for an OPAS action. In addition, NSF

reserved the right to withdraw the delegated authorities if a university mismanaged them. NSF needs adequate documentation to review university management of the authorities.

6. While NSF believes they were providing adequate guidance in this example (see pp. 31-32), university officials told us that NSF's handling of the transition caused some problems and confusion. In addition, we found other examples in which participants did not feel they were adequately informed by NSF. Particularly because it is an experiment, we believe that NSF should assure that it provides each university with the necessary information and guidance to allow it to function smoothly.

7. Since NSF acknowledges that including this university (see pp. 29-31) in the experiment might have imposed some risk, it is difficult to understand why NSF was not closely monitoring the university's activities. Also, it is difficult to understand why NSF would allow a university criticized over the years for "some lack of financial accountability" to delegate all of the authority to review and approve grant administrative and budget changes to one individual for the Master Grant phase. We believe the decision by the university to include the "Grants Office" in the OPAS for Phase II will provide better accountability.

8. We believe the relatedness concept has many positive aspects, as discussed in our report, even though it will result in a limited loss of financial accountability for individual research grants. We agree that the concept of relatedness may reflect reality better than the notion of grant by grant financial accountability. Traditionally, research has been funded on a discrete grant basis and accounted for in the same manner. NSF states that investigators often allocate costs in a subjective manner and sometimes on the basis of the availability of the funds but does not point out that this is contrary to Federal regulations. This should be noted. We do not object to redefining a grant to reflect more accurately what is actually occurring at the research level. However, we do believe that this is a matter that the cognizant congressional committees should be aware of.

9. In interviews with NSF officials, we were told that NSF requested and was given permission by the cognizant audit agencies to assume responsibility for the audit of all grants under the experiment. However, NSF now maintains that audit responsibility was not shifted and continued to be the responsibility of the cognizant audit agencies (see p. 34). Therefore, our recommendation that NSF provide adequate audit coverage or return the responsibility to the cognizant audit agencies is no longer necessary.

10. Our recommendations relate to both the experiment and any ensuing implementation of its concepts. We wish to reiterate

66

that Phase II should be thoroughly evaluated before expanding the experiment.

ENCLOSURE 2

11. The first recommendation does not assume an answer; it recommends the minimum requirements that we believe are necessary to assure accountability for NSF funds. We are not requiring a second scientific review as NSF suggests. NSF already requires the OPAS to review actions for scientific or technical need and propriety. Our recommendation was made to assure that the OPAS has or has available the expertise necessary to make this review. We have clarified the wording of the recommendation to reflect this.

12. While NSF regards OPAS systems and the requirements for OPAS actions as variables with which they are experimenting, we believe our recommendations constitute the minimum requirements that should be implemented for OPAS systems and actions.

13. No response required.

14. We are looking forward to seeing the results of NSF's review of Phase II. However, we wish to reemphasize the necessity that the review be conducted by official(s) independent of those managing the experiment.

15. This recommendation is one that is necessary throughout all phases of the experiment and any future implementation.

16. As discussed in our response to point #9, we have deleted our recommendation in light of the additional information NSF provided.

ENCLOSURE 3

Many of these "apparent" errors are additional information or clarifications supplied by NSF as noted below.

17. Additional information added (see p. i).

18. Additional information added (see p. 1).

19. Clarification made (see p. 2).

20. Change made (see p. 60).

21. Clarification made (see p. 61).

22. Change made (see p. 65).

23. Additional information added (see p. 15).

24. We disagree with NSF's suggested addition to p. 16. We believe that NSF should have reviewed the OPAS policies and procedures before delegating authorities to the universities to assure that the OPASs had the capability to handle the delegated authorities (a thorough discussion of this university's problems can be found beginning on p. 29).

25. Clarification made (see p. 22).

26. The change that is indicated has been made on p. 31. During the course of our review, NSF officials informed us that NSF did not delegate responsibility for monitoring special grant conditions to the OPASs. As shown in the example cited, at least one university was not aware of this responsibility. We modified our recommendation to require NSF to assure that the OPASs are aware of their responsibility to monitor special grant conditions.

27. We disagree--we did clarify this section (see p. 37) by noting that some of the increase was probably a one-time effect due to the changes, as NSF pointed out in its comments (see point #23 of the letter).

28. As discussed in our response to point #26, the change that is indicated has been made.

29. Our recommendation has been deleted, as discussed on page 43.

30. As discussed in the footnote on p. 60, several revisions were made to NSF's grant administration requirements which were not incorporated into the draft since they were not in effect at the time our review was made. No-cost extensions were approved by the NSF policy officer prior to the change in March which gave this authority to the NSF grants officer. The revisions noted in NSF's comments have been incorporated into a footnote at the bottom of table 7. The approval of the purchase of general purpose equipment was changed to the NSF grants officer.

OMB'S COMMENTS AND GAO'S RESPONSE

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

APR 2 0 1982

Mr. William J. Anderson
Director, General Government Division
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Anderson:

This is in reply to your letter of March 18, 1982, requesting comments on the draft report, "NSF's Experiment in Research Grant Administration Looks Promising But Changes Are Needed to Assure Accountability." The review focused on an experiment by the National Science Foundation and the Association of American Universities in more flexible procedures for administering research grants to universities. Our comments are limited to those parts of the draft report pertaining to OMB involvement.

The draft report indicates on page 1-20 that OMB officials agreed that funds spent on one grant could be reported under another closely related grant, and that the peer review system would assure the scientific integrity of the related projects. This appears to be an oversimplification of the OMB position. While we agree that peer review is a useful control, final decisions on matters of accountability rest with the grantmaking agency. In some cases, one grant may involve several related activities; in other cases, a number of separate grants may be made for related purposes. In either case, an acceptable level of accountability must be maintained.

OMB does not endorse, as the draft implies, the principle of charging costs to one grant that were actually incurred in another. However, we do recognize that in some cases it makes sense to combine the accounting for closely related grants, permitting control to be maintained over the combined activities. Whether these combined activities then constitute one grant or more than one grant is a decision best left to the sponsoring agency.

We agree with the basic conclusion of the draft report that the NSF experiment can have important benefits in terms of eliminating red tape and improving Federal-university relationships. The draft report points to the need for effective and timely agency monitoring and audit follow-up to assure that the system is working and that necessary accountability is maintained. With such a follow-up system in place, we believe that the NSF experiment should continue.

Sincerely,

Joseph R. Wright, Jr.
Deputy Director Designate

GAO'S RESPONSE TO OMB'S COMMENTS

We are pleased that OMB agrees (1) with the basic conclusion of the draft report that the NSF experiment can have important benefits in terms of eliminating red tape and improving Federal-university relationships and (2) that timely agency monitoring and audit follow-up are necessary to assure that accountability is maintained. Although OMB's response indicated that the draft report might have oversimplified their position on the relatedness concept, we both agree that an acceptable level of accountability must be maintained. We also agree that in some cases it makes sense to combine the financial accounting for closely related grants, permitting control to be maintained over the combined activities. However, we believe that since this is a change in the way basic research grants are accounted for, it is a matter that the cognizant congressional committees should be aware of.

COMPARING THE STANDARD AND EXPERIMENTAL POST-AWARD SYSTEMS

Post-award administration responsibilities for NSF grants are divided between NSF and the university as discussed in NSF's Grant Policy Manual. 1/ Since the experiment focuses on the post-award administration of research grants, the following sections will compare the standard and experimental post-award policies and procedures used by NSF and its grantees. Areas of post-award concern include monitoring grant performance, changing grant scope, objectives, or principal researcher, approving research expenditures not provided for in the grant award, changing the grant budget, and grant reporting requirements.

MONITORING GRANT PERFORMANCE

Under the standard system, the grantee is responsible for monitoring the performance of the grant to assure adherence to (1) performance goals, time schedules, or other requirements which may be appropriate to the grant, and (2) sound management practices and organizational policies. NSF may make site visits as appropriate to keep informed of the progress of the work and to review grantee management control systems. NSF also takes appropriate action based on its review of progress reports and final technical reports.

Under the experimental system, responsibilities remain the same.

CHANGING GRANT SCOPE, OBJECTIVES, OR PRINCIPAL RESEARCHER

Under the standard system, neither the material under study nor the objective of the grant stated in the proposal is to be changed without prior NSF approval. Such changes should be proposed to the program officer by the researcher in a letter countersigned by an authorized university official. Since NSF's decision to support a research proposal is based to a considerable extent upon its evaluation of the proposed researcher's knowledge of the field of study and capabilities to conduct the research in an efficient and productive manner, the university must notify NSF if the researcher plans to relinquish active direction of the grant. The university may either initiate grant closeout procedures or nominate a substitute researcher to continue the grant.

1/Several modifications were made to the Grant Policy Manual in March 1981 and again in October 1981 but are not included in this report since they were not in effect at the time the actions reviewed were made.

If the substitute researcher is approved by NSF, the grant will be appropriately amended. If NSF does not approve the substitute, the grant will be closed out. If the researcher will devote a substantially different amount of effort to the work than anticipated, he or she must inform university officials and the NSF program officer. If either determines that the reduction in effort would be substantial enough to impair the success of the project, the NSF grants officer will be asked to take appropriate action such as replacing the researcher, terminating the grant, or modifying the grant.

None of the research or substantive effort under an NSF grant may be contracted, or otherwise transferred to another organization, without prior NSF approval. In the event the need arises to contract part of the research effort after a grant has been made, the grantee must submit to the NSF grants officer the proposed performance statement and budget, a statement indicating the basis for selection of the contractor, and a justification of the proposed arrangement. The request must be signed by the researcher and endorsed by an authorized university official.

The experimental system has the same requirements with one exception. If a researcher wants to contract part of a grant's effort, he or she submits to the OPAS the proposed performance statement and budget, a statement indicating the basis for selection of the contractor, and a justification of the proposed arrangement. The OPAS reviews and either approves or declines the request. No NSF approval is required.

APPROVING RESEARCH EXPENDITURES NOT PROVIDED FOR IN THE GRANT AWARD

Under the standard system, if an expenditure is proposed in the grant budget and justified in the narrative, provision for it in the grant constitutes NSF approval unless the grant specifically indicates the contrary. If provision is not made in the proposal, prior written approval of NSF's grant officer, program officer, or of the university-wide OPAS [1] as required, should be obtained before action is taken to purchase a particular item or service (see table 7) since it cannot be charged to an NSF grant without such approval.

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[1] The university-wide OPAS is called the UwOPAS to distinguish it from the master grant OPAS.

Table 7

Approving Changes in the Grant Awards

Prior Approval Authorities	Approval Required Under Standard System	Experimental System
Fund transfers (aggregation) a/	not allowed	OPAS
Expenditures for related grants (relatedness) a/	not allowed	OPAS
No-cost extension b/	NSF program officer	OPAS
Alterations and renovations		
under $1,000 c/ d/	UwOPAS	OPAS
$1,000 or more	NSF grants officer	OPAS
Contractual (third party) costs	NSF grants officer	OPAS
Equipment		
Special purpose: $1,000 or more	NSF program officer	OPAS
General purpose	NSF grants officer	NSF grants officer
Cumulative expenditures which exceed budgeted amount by more than 25% providing the cost is under $1,000 c/	UwOPAS	OPAS
News release costs d/	NSF program officer	OPAS
Pre-award costs	Not allowed	OPAS
Commercial production or distribution of books, films, etc.	NSF grants officer	OPAS
Rental or lease of facilities d/	NSF grants officer	OPAS
Travel		
Each foreign trip	NSF program officer	OPAS
Cumulate domestic travel expenditures which exceed 125% of amount budgeted, or $500, whichever is greater c/	UwOPAS	OPAS
Dependent foreign travel	NSF program officer	OPAS
Hiring consultants not provided for in grant proposal or award c/	UwOPAS	OPAS

(Footnotes on the bottom of p. 47.)

To carry out its responsibilities for adhering to grant terms and conditions and monitoring grant performance, each university is supposed to have a system to ensure that authorized officials provide necessary organizational approvals in advance of any action that would result in either the performance or modification of an NSF grant where such approvals are required. The university must designate an appropriate official or officials to review and approve the types of actions described above. The designated official may not be the researcher or any official having direct responsibility for the conduct of the grant. Preferably, the official(s) should be the same official(s) who sign(s) or countersign(s) those types of requests which require submission to, and approval by, NSF.

NSF requires that the university's prior approvals be documented. The documentation should include a justification of the action requested, including identification of the budget categories affected. An appropriate official at a management level should review the request for policy permissibility and fund availability. An appropriate official, at an administrative level above that of the requestor, should review the request for scientific propriety, research relevance, and effective use of the institution's resources. The request should receive final approval by a designated university official.

NSF uses its program and grant management staffs to carry out its portion of grant monitoring responsibilities which involve furnishing prior approvals. Two copies of all requests for budget changes requiring NSF prior approval must be signed by the researcher and countersigned by the grantee's authorized representative, and sent to either the NSF program officer or grants officer. The request should clearly state which budget items are to be changed and by what amounts, and should explain the reasons for the change.

(Footnotes to table 7)

a/Phase II substituted the relatedness concept for the aggregation concept.

b/A modification was made to NSF's Grant Policy Manual in March 1981 which gave this approval authority to the NSF grants officer.

c/In 1977, NSF delegated these prior approval authorities to any university which established an organizational prior approval system. We use the acronym UwOPAS (university-wide OPAS) to distinguish it from the master grant OPAS.

d/The October 1981 revision to NSF Form Letter 118 increased the dollar figure for alterations and renovations to $10,000 and no longer requires special approval for news release costs or rental or lease of facilities.

As in the standard system, in the experimental system an expenditure proposed in the grant budget and justified in the narrative is considered approved by NSF unless the grant specifically indicates otherwise. However, OPAS approval replaces approval of the NSF grants officer, program officer, and the university-wide OPAS for expenditures not included in the proposal. Also, as in the standard system, NSF requires that the OPAS approvals be documented.

CHANGING THE GRANT BUDGET

Under the standard system, if the researcher wants to transfer funds from one approved grant budget line item to one that requires prior approval, such prior approval must be obtained (as summarized in table 7). When a budget change requires NSF approval, two copies of a request, signed by the researcher and the grantee's authorized official, should be sent to the cognizant NSF office. The request should clearly state which budget items are to be changed, by what amount, and the reasons for the changes.

If the action does not require prior approval, the grantee may make the change as long as the expenditure meets the requirements of the Federal cost principles. NSF elected not to impose on its grantees the following optional requirements of OMB Circular A-110: (1) prior approval for transfers between direct and indirect cost categories of the grant budget; and (2) restrictions in transfers of funds among direct cost categories for grants in which the Federal share exceeds $100,000.

An expenditure may not be charged to an NSF grant prior to the effective date of the grant. However, commitments requiring long lead times, such as for major items of equipment, may be initiated prior to the effective date at the risk of the grantee, for delivery subsequent to that date. If a grant is made and such items are approved, NSF funds may be expended for them on or after the effective date of the grant.

If additional time beyond the expiration date is required to assure adequate completion of the original scope of work within the funds already made available, a request for a no-cost grant extension must be sent to the program officer. The request should include a summary of progress to date, funds remaining, and plans to complete that part of the grant for which the extension is being requested. The need for an extension of time must be justified.

Under the experimental system, if a researcher wants to transfer funds from one approved grant budget line item to another line item that requires prior approval, prior approval must be obtained from the OPAS. If the action does not require prior approval, the grantee may make the change as long as the expenditure meets the requirements of the Federal cost principles. No NSF approval is required.

An authority newly delegated to the OPAS under the experiment allows grantees to incur costs before the effective date of the grant. However, the costs incurred are at the risk of the grantee. The experiment allows the grantees to be reimbursed for costs incurred prior to the award (pre-award costs) provided that (1) the OPAS determines for each cost item that the advance funding was necessary for the effective and economical conduct of the research; (2) the costs are otherwise allowable under the the terms of the anticipated grant that will provide the funds; and (3) the costs were incurred within the 90-day period immediately preceeding the effective date of the grant. No NSF approval is required.

The OPAS was also delegated the authority to grant no-cost extensions. The experiment allows the OPAS to extend the expiration date of any grant for up to 6 months. The OPAS is required to review summaries of progress, funds remaining, and plans for the completion of the grants for which extensions are requested. The researcher is required to justify the need for the extension. No NSF approval is required.

GRANT REPORTING REQUIREMENTS

Under the standard system, NSF established the following reporting requirements for its research grants. Financial reporting is done on a quarterly basis with each grantee updating a list of grant expenditures, called the Federal Cash Transactions Report (FCTR), supplied by NSF. The FCTR lists each grant's net award and cumulative disbursements through the prior quarter and provides space for the university to supply the net disbursements for the current quarter. NSF has designed its procedures to extract final financial information from the FCTR.

NSF requires annual progress reports for each grant. The progress report should include a summary of: (1) overall progress, including results obtained to date, (2) current problems or favorable or unusual developments, (3) work to be performed in the next grant period, and (4) other information pertinent to the type of grant being supported.

NSF requires a Final Project Report within 90 days of the expiration of a grant. This form contains a summary of the completed research and space to indicate the status of submission of final technical information items for program use. The final technical items required to be submitted include abstracts of theses, publication citations and reprints of articles, data on scientific collaborators, information on inventions, and a technical description of the research and results.

The reporting requirements for the experiment's grants remained basically the same except for financial reporting. In the Master Grant phase, each master grant appeared as a single award on the FCTR sent to the grantee quarterly. Expenditure data entered by the grantee was the single cumulative total for all grants under each master grant. The experiment had the same requirement for the annual progress report for each individual grant in the master grants. The Final Project Report was to be submitted on an aggregated basis for all grants under each master grant. The final technical information items listed and any other unique reports or end products specified for particular grants were to be submitted on an individual basis for each grant. In Phase II, reporting requirements are the same as for the standard system.

NSF also required copies of OPAS approval forms, or equivalent summary records, documenting actions taken on all master grants to be sent to NSF on a periodic basis. Phase II originally did not require copies of OPAS actions to be sent to NSF, except for requests of two or more researchers to relate grants. In June 1981, NSF asked all Phase II participants to send copies of their OPAS actions to NSF.

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78